SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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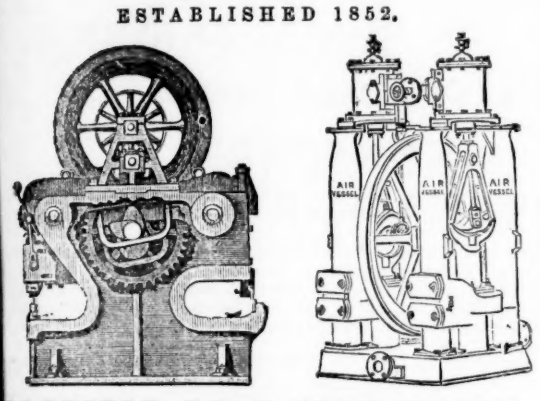

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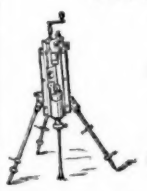

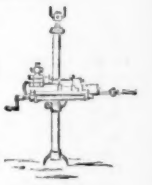

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MESSRS. HAYWARD TYLER AND CO., January 24th, 1877.

GENTLEMEN, In reply to yours of the 15th inst. (which absence prevented my attending to earlier), I am very pleased to add a testimonial to the efficiency of your "Universal" Steam Pump. The one you supplied to us has worked most satisfactorily for the past six months, without giving us the least trouble. It is lifting over 2500 gallons an hour up a perpendicular height of 480 feet—going 30 strokes per minute, with a steam pressure of 30 lbs. per square inch—boiler 340 yards from pump. I can strongly recommend it as the most efficient pump for high lifts ever seen. I shall be very pleased to give information to any of your friends, or take them to view it working.—Yours faithfully,

EDWD. W. B. MONKS, Managing Director.

ECKINGTON, February 4th, 1877

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GENTLEMEN,—In reply to your inquiry, the 15 by 7 Long Stroke Pump Messrs. Hayward Tyler and Co. supplied us with is working remarkably well; 7 ft. suction, and forcing the water 180 ft. perpendicular, with 40 lbs. of steam.

Before putting this engine in we had one H. P. pumping engine. 50-inch cylinder, 9 ft. stroke, and firing six boilers, 36 ft. by 4 ft. to drive it; now we only require two of the above boilers to do the same work with much less annoyance and attention. I am, Gentlemen, yours truly, JOHN MARPLES.

Engineer for J. and G. WELLS, Eckington Collieries.

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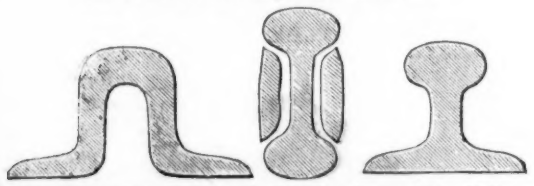

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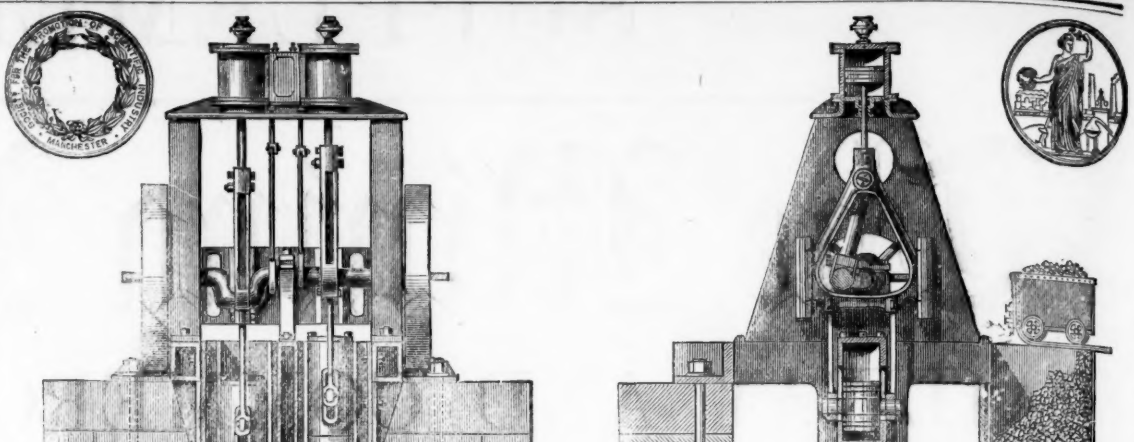

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For Pulverising Tin and Lead Ores, Gold Quartz, &c.,

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All objectionable features of "wear and tear" common to the original and existing Pneumatic Stamps (driven be belts) are removed in this patent, and leather glands and stuffing boxes entirely dispensed with, the pneumatic piston being reciprocated into the compressing chambers by direct-action from without. These double machines are guaranteed to be of the capacity of 36 ordinary heads of cam and lifter stamps, and engineers will at once see that, inasmuch as the power is directly applied to its work (without the medium of belts and other gearing), the minimum consumption of coal (all other conditions being equal) must be the result.

The COST OF THESE MACHINES (including boiler) is about ONE-THIRD OF THE ORIGINAL CAM AND LIFTER STAMPS, to do the same work.

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" THE CLIFTON AND KERSLEY COAL COMPANY, near Manchester.
" THE ST. BRIDE'S WELSH SLATE AND SLAB COMPANY, Haverfordwest.
" THE WARTON LAND COMPANY (LIMITED), Silverdale, near Carnforth.
" THE MONTIPONI SOCIETY, Turin, Italy.

The following letter has recently been received from the Ebbw Vale Company:— Ebbw Vale Works, Monmouthshire, July 5th, 1878.

GENTLEMEN,—I have much pleasure in stating that in the execution of your contract to drive, for the Ebbw Vale Steel, Coal, and Iron Company (Limited), a cross measure Drift from the Old Coal to the Rock Vein Coal, in the Glyn Pits, at Pontypool, you did so with dispatch, and to the entire satisfaction of all concerned. The distance driven was 453 yards in about 13 months. Yours faithfully, ROBERT JORDAN, Mining Engineer, Ebbw Vale Company's Collieries and Mines.

[The size of the above heading is 9 ft. by 13 ft.]

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PRICES ON APPLICATION

Original Correspondence.

THE DISCOVERY OF GOLD IN INDIA.—No. I.

Reference was made in last week's *Mining Journal* to the highly successful explorations of Mr. R. Brough Smyth in the auriferous district of South Wynaad, where he had already discovered, in an area of 25 miles by 13, no less than 90 outcrops of ore reefs, with a thickness of 2 ft. to 4 ft., yielding from a few pennyweights to 200 ozs. per ton. From the samples of the auriferous quartz which have been received by Messrs. Smith, Fleming, and Co., it is evident that the veins are very similar to some of those which have been most successfully wrought in Victoria, Australia; indeed, the resemblance to some of the Bendigo reefs is striking—abundance of visible gold, and the quartz stained with iron just in the same way. Other specimens show the gold in nicely decomposed matrix, and still others consist of rich auriferous gravels, so that, considering the large area over which the deposits are now proved to exist, there can be no question that there is a good field for British enterprise, more especially as labour is extremely cheap and abundant, and there are the utmost possible facilities for working. Some few months since the district was inspected for the Bombay branch of Messrs. Smith, Fleming, and Co., by Mr. Oliver Pegler, A.R.S.M., and although he appears to have made but a superficial survey at the time when he made the report, from which the subjoined are extracts, he has recorded enough to show beyond doubt that the district is capable of yielding enormous wealth. It appears that for the last two or three years Messrs. Smith, Fleming, and Co., have been actively engaged in connection with the matter—the delay having arisen principally from the fact of the district having hitherto been regarded almost exclusively as a coffee-producing district, which necessitated tedious negociations for securing planters' rights. In this they have been fairly successful, so that there is at present every facility for extensive and profitable operations.

It should be distinctly understood that Mr. Pegler's present report is essentially crude and preliminary. His earlier work, he writes, was carried on under difficulties; many obstacles were placed in his way, and as far as the Alpha Mine was concerned he was kept from inspecting it, and it was only by resorting to a ruse that he visited the reef at all. Even then he was not shown the working where the gold existed in such astonishing richness, the excuse being that the place was under water. It was only upon his leaving that he heard the gold really did exist, and of course, on his later visit, he inspected the working. His report does not, therefore, strictly accord with what he would write with his present knowledge, his second visit having impressed him more favourably than the first. The report of this second visit will be published hereafter, but it may be at once stated that as the result of it he writes that he has no doubt exploration will give great results.

The range of mountains on which the Wynaad district is situated is of very ancient date, belonging to the palæozoic period, more especially to that of the silurian formations. The highest peaks of the range, as in the neighbourhood of Otacamund, are formed of hard, dense, dark crystaline rocks of the metamorphic series of granites, syenites, and the more fissile varieties are also here present, and being softer they have yielded to the disintegration and denudation of time, and have formed the valleys and dells adjacent to the peaks. These softer rocks are of a much lighter colour than the harder granite and crystaline formations, and give a red and brown appearance to many portions of the surface of the country. The average altitude ranges from 7400 to 8400 ft. Before leaving this portion of the Neilgherries for the more auriferous districts of Wynaad, I may observe that the whole of the formations are impregnated with black magnetic oxide of iron, which after a shower of rain appears as black sand on surfaces where the water has run over in streams. This is particularly noticeable along the roadsides. The crystalline rocks continue for a considerable distance down the slopes towards the Wynaad country, becoming lighter in colour, coarser in texture, and more laminated and fissile in structure, changing into the gneissic and more laminated varieties of metamorphic rocks. These orders are prevalent throughout the Wynaad district, although here and there the granite and syenite certainly do occur, but they now seem to have given place to the gneissic and laminated rocks.

I will enumerate the several peculiar formations which constitute the superficial crust of the country, and I may state that even now our knowledge is very imperfect relating to this question. Our experience is necessarily of a very superficial character. The extent of ground is very vast, and we are without profound mining operations to lead us to form an opinion of the deeper structure of the crust of the country. We have gneiss of light grey and pinkish shades often changing to granite, dense, hard, or coarse, easily disintegrated, and forming soft rock. Greenstone, chlorite, and diorite of hard fissile texture, with the planes of separation vertical. Talcose schists not thick, but in character very light, soapy, and talcose. Slaty decomposed agilaceous rocks, often stained deeply with ferruginous matter. It is difficult to say what this formation is, unless it is produced by ulterior decomposition and disintegration of the gneiss or granitic rocks.

Granite of the dark hornblendic class.—I am also inclined to think fleshy varieties exist tending to gneiss, the surface being disintegrated and soft. Syenite undoubtedly is present. As previously mentioned, the granite and syenite do not show at the surface to any great extent, although it is possible that upon cutting through the more yielding and softer surface formations the harder crystalline rocks would be met with more generally. The whole surface of the ground is contorted, upheaved, and thrown about, forming abrupt ridges, valleys, peaks, rounded hills, and depressed surfaces; so that, combined with the altered metamorphic condition of the rocks, I consider it a most difficult problem to determine the true strike of the strata generally. Regarding the mineral question at issue, I may state that the whole of the country is ramified with a run of bold quartz veins, which are true reefs. The general run of these reefs is parallel, the direction of strike being almost invariably north and south, a few degrees west of north and east of south. The dip of the reefs is very low as seen at surface, and almost invariably to the east, varying when outcropping on the brows of the hills, especially when heavily developed, from almost horizontality to from 20° to 30°, and increasing in dip in lower grounds. These reefs, which are met with in every part of the country, are often of great breadth, up to 15, 20, and 30 ft. of thickness, and are composed of white crystalline compact quartz, identical in every respect with the reef quartz of Russia, Australia, California, Nevada, or any other known gold bearing country.

The quartz or veinstone, of course, is of varied character, changing from the compact sub-crystalline milk-white stone, to flesh colour, red, and brown, to a coarse nature highly ferruginous, charged with sesquioxide of iron, pyrites, pyrolusite, the vein soft, disintegrated, and laminated in structure, changing in some instances into a decomposed granitic nature, and thence footwall and lower country rock into talcose or micaceous schistic rock. The Bear reef is of this class. Almost invariably the large outcrops, which are very dense, compact, and hard, also the hanging or upper part of the lodes, are of this white quartz, but as the depth is increased the under or footwall changes into the ferruginous stone, or emerging into the schistose or decomposed rock beneath, deeply stained red with iron. Of course the several lodes vary much, some having the hard, dense, bold aspect, especially when striking across a hill summit, as in the Monarch reef; others show more the soft, porous, stained appearance, especially when outcropping under the brow of an escarpment; but I think that even in the boldest and most dense lode at a little depth the footwall will show this stained and less compact aspect. At a greater depth the stained appearance would again cease.

The Bear reef is an instance of the more ferruginous class of reefs. From the footwalls of these lodes leaders or small veins seem to strike to the west from the main reef, but I am inclined to think in many instances these supposed leaders are small flat parallel lodes which have been formed in the interstices of the laminated bed-rock, or in other instances portions of the main lode where, from the soft, slaty, laminated nature of the country rock in the earlier formation of the reef, it has broken up into numerous bands. The enclosed granitic disintegrated materials, as in footwall of Bear reef, are evidently portions of enclosed rock or horses which have become disintegrated and changed. The Monarch reef is traced for nine miles. An outcrop of true chlorite or greenstone runs very near it.

The description of the two reefs may be taken as typical of all the various quartz veins or true lodes which occur here. It must, of course, be understood that all the possible variations between the two extremes above referred to will be met with. In the same reef in the course of its strike across the country will be found all the features of variation, from the hardest and densest outcrop to the soft decomposed vein in the different points of its run. In the Monarch reef this is forcibly apparent at some little distance from the hilltop overlooking Devalah. In the lower ground the lode becomes soft and broken up.

Certain peculiarities in the physical aspect of these reefs may be briefly alluded to. Their dip is to the east, and at the higher peaks where outcrops appear the lie or dip is very low—only some 10°—and sometimes the reefs seem to form the back or slope of a hillside. The dip is nearly always to the east. On entering lower ground they are found to increase in dip, and average from 15° to 30°—generally 20° to 30°. Almost invariably where the reef runs parallel to the run of the hill an abrupt and steep fall will be found to occur to the west of the strike, thus forming a bold escarpment, while on the eastern side the slope of the hill is very gradual. The reason of this is quite evident. The hard overlie and top of the reef forming a back and protection to the eastern slope enables it to resist the action of denudation; not so the western. The underlie here, the soft footwall, and the soft schistose casings beneath easily disintegrate and crumble away; thus landslips are formed, resulting in an escarpment, and the gradual wearing away of the reef from west to east.

From these slight descriptions of the quartz reefs of the country it will at once be clear that the dense, compact, heavy lodes have resisted denudation, and thus the high ridges and hill tops are formed. The softer, porous, foliated, and laminated portions of the run of the reef have been eroded away. It is a strange fact, which bears out the above, that many of the highest and boldest reefs which form the caps and ridges of the highest hills have no signs of having been touched by the native miners, who avoided, apparently, working on such dense, compact, adamantine stone, and preferred the softer, more yielding veinstone on lower elevations.

From the above it does not follow that the solid compact development may not exist in the flatter land, or that the softer lode may not occur on a hill. Lodes are apt to change in depth in every possible way; a dense heavy lode may suddenly give way to the yielding one, and a soft, split up, or small and poorly developed reef may at a few fathoms depth suddenly or gradually change into a very thick, heavy, compact lode.

Mr. King, who wrote a report in 1877, estimates that 2000 ft. of superincumbent gneissic formations have been removed, but his several deductions thereto are scarcely tenable. In the metallic constituents common to the reefs pyrites is present in large amount, and iron and copper sulphides. It is probable also that sulphide of silver is associated with these mixed sulphides, of which the iron pyrites predominates. Pyrolusite and manganic oxides are present, and I am inclined to think that cobalt or nickel may possibly be found to exist. Magnetic oxide of iron abounds as black sand, and is present throughout the various country rocks. As necessarily follows, for a certain depth below the surface, within reach of the atmospheric influences, the pyrites has become decomposed to a great extent, changing into hydrated and sesquioxides of iron, giving a highly stained and ferruginous aspect to the lodes, more especially to the footwall. It seems to be in the lower part of the reef or lode that these heavy pyritous elements have settled. There can be no doubt that at a sufficient depth to resist atmospheric action the pyrites is unchanged, and the vein will assume a dense and hard character throughout. There can be no doubt that a great portion of the gold is closely combined and held imprisoned by the pyrites, which is undoubtedly auriferous in nature, and much resembles the auriferous pyrites of the Nevada mines. The ancient miners well knew this, and calcined all the stone before attempting to separate the much-wished-for gold, and to this day the intelligent Korumbars, who still mine and search for gold, calcine before crushing, washing, and amalgamating the residual fine gold.

There can be but little hesitation in determining the auriferous character of the contained pyrites, and in at once deciding that the Wynaad is a gold bearing land, and its reefs truly auriferous. The great question is whether this country is of sufficiently auriferous a character as to give reasonable expectations of the successful issue of any mining operations which might be entered into on a large scale. The native Korumbars and Pannies still search and wash for gold, and find minute quantities, probably owing to the continued annual breaking up and disintegration of the innumerable fragments of veinstone which abound on certain flats and slopes. All this, however, is quite superficial. The alluvial deposits occur as recent and ancient.

RECENT.—First, surface earth, which spreads over the whole country. Second, present river beds and bars. Third, recent deep alluvial deposits. Operations are only carried on by native washers in the first and second at present, and we know but little of the latter deep deposits, which occur as large extending flats, and are now swamps often utilised for cultivating rice and paddy. At or near Devalah I discovered evidences of extensive old workings on one of these flats, numerous pits or shafts having been sunk, probably to the lower white clay or mother rock, and the lower stratum of recent earth, debris, or clay, would contain the gold.

ANCIENT DEPOSITS.—Of these also we have but few indications; however, since the writing of Mr. King's report satisfactory proofs have been arrived at of the presence of these in the Wynaad. Ancient alluvial beds and deposits are common to all true gold countries, and are the accumulations of old rivers or sheets of water, which flowed and extended, geologically speaking, many ages ago when the crust of the country was higher and less denuded than at the present time, when the streams have eaten deeper into the earth's crust, have become narrower, deeper, and more rapid in their flow. The contour of the country having completely altered, the present streams running in very different courses, and, as explained above, at a much deeper level than the ancient streams. As may be expected, the deposits may be discovered where no existing river is near for some miles, through great alteration of the surface of the country. Often these cement beds, as they are now frequently called, have become covered up by more recent surface washings, by the disintegration of the higher slopes at dates after their deposition, for it must be remembered that, whilst the main level of streams are lower than the ancient beds, a river running at a higher altitude may have had its course ultimately turned over the bed, which occurred at a lower elevation on the sloping country, and would thus cover up and hide the ancient bed.

Now, these cement beds are all more or less auriferous, and in America are washed bodily down by gushing shoots of water in great quantity. They run down long and wide gutters for some miles, the gold settling among the stones which pave the bottom of the channel, and is collected at various periods. In other places, where the cement is too hard or water scarce, the deposit is removed and crushed bodily. If too poor the lowest portion resting on the mother rock or older strata is simply mined. Sometimes shafts are sunk considerable depths to cut and work these beds. At Seeputtee the present river of that name has cut through an ancient and true cement deposit, and a clear section is shown on the present river escarpment at a very few feet above the present stream. The ancient bed exists as a mixture of rolled pebbles, mostly quartz stone, fragments of country rock, &c., cemented with the sand and (evidences of a dark material) also white clayey and silicious seams into a hard dense conglomerate. There is a section of some 20 to 30 ft. at its deepest portions, and above it some 10 or 15 ft. of recent alluvial deposit, thus disguising its presence. The bed rests on the mother rock, which is very soft and decomposed, of a red colour, as if of a granitic or gneissic nature, but much decomposed, probably at the time of the ancient sheet of water or stream existing above. The present stream cuts it almost at right angles, or apparently so, and there can be no doubt that the old bed represents a true auriferous cement deposit, and was deposited by a very different system of river courses and flow to those existing at the present day. It has been pierced to same 20 or 30 ft. by a drift, which was full of water when I visited it, but which did not prevent it being seen into. The drift had been left at its commencement, probably through the intense compactness and obduracy of the deposit.

The natives had also made some attempts at working the bed, and had evidently removed some 4 tons of the material, but had given up attempting to mine the deposit, the small amount of gold present evidently not being sufficient to induce further work. They had worked into the soft rock beneath the deposit, and then broken down the suspended cement. There can be no doubt that this bed of cement is auriferous, but to a very limited extent. It is, however, quite possible that the lowest strata of the deposit might be worked to a profit, as there is sufficient water adjacent for almost any purpose. *(To be continued in next week's Journal.)*

GOLD IN INDIA.

SIR,—The telegrams which appeared in the London newspapers of the 13th inst. from Simla and Bombay may lead to the impression that gold has only just been discovered in Wynaad. The Malabar district has been famous for gold from time immemorial. The first official intimation of the gold working in the Nellumboor Valley and Wynaad was made to the Madras Government by Mr. Sheffield, Collector of Malabar, in January, 1831. A full account of the auriferous rivers of the district and the mode of washing the gold out of the surface soil and river sands was given, and Mr. Sheffield suggested that the quartz matrix from which the gold was washed down would probably be found in the neighbourhood of Davalah, Wynaad, and the Koondah and Neilgherry Mountains. A commission was appointed to report upon the matter. The Commissioners, however, without any professional knowledge of the subject, seem to have confined their attention chiefly to the prospects of alluvial washing in the valleys and low country, which they believed would necessitate works of vast proportions and expenditure of a greater amount of capital than seemed warranted by the expected results. The value of the reefs in the higher country about Davalah (some 3000 ft. above sea level) appears never to have been considered seriously until 1874, when a quartz miner from Australia went to Davalah and settled near what is now known as the Alpha Reef. He was supported by some neighbouring coffee planters; and, having satisfied himself that the quartz would pay for crushing, he, in conjunction with his planting friends, started the Alpha Mining Company. His specimens of gold in quartz attracted the attention of the Madras Government. Mr. King, Deputy-Superintendent of the Geological Survey, was deputed to report on the Wynaad quartz reefs, and the late Lord Hobart, Governor of Madras, visited the place, and thus attracted further attention to the subject.

Many trials of the stone have since been made, and in February last 104 tons of the quartz were crushed at the Alpha Works, from which 100 oz. of gold was obtained. Sir Andrew Clarke visited the district in February last, and Mr. Brough Smyth, the eminent mining engineer, was invited to inspect and report on the reefs. Recent telegrams serve to show that his labours have been highly successful, and it would appear that the south-east Wynaad is destined to assume a position of considerable importance as a gold-producing country. The district being mountainous, mining operations can be conducted at a comparatively low cost, as the workings can be easily drained by means of levels driven into the sides of the hills, no expensive pumping or lifting machinery being required. Ample water-power is obtainable for driving the necessary crushing machinery; there is a cheap and abundant supply of timber for mining purposes, and with cheap native labour Wynaad should have great advantages over other countries in quartz-crushing. It is calculated that 5 dwts. of gold to the ton of quartz will cover all expenses. With regard to the climate, there is no doubt that jungle fever is prevalent during March, April, and May; but with care and quinine this is no longer the bugbear it used to be. For nine months in the year the climate of Wynaad is far better than it is on the plains. Davalah is about 70 miles from the seaport towns of Beypoor and Calicut, and there are good cart-roads to these ports.

As to the suggestion of a probable rush of diggers to the Madras Presidency, I know from many years experience on the Malabar coast (as general manager for the East Indian Iron Company) that Europeans cannot stand hard physical labour in India. The proper place for Europeans is to supervise and instruct native workmen. A gold rush would be madness; the country is as thoroughly worked out, for all alluvial deposits, as is Ballarat; and to do anything with reefs requires the capital necessary to put up expensive crushing machinery. There is, no doubt, a good field for skill and capital, and money can, and no doubt will, be made in the district.

Plas Onn, Mold, Nov. 16. —— WILLIAM MAYLOR.

GOLD IN THE MADRAS PRESIDENCY.

SIR,—A great surprise appears to have been created by the announcement of the discovery of gold-bearing rocks in the Madras Presidency, by finding some quartz reefs on the west escarpment of the Neilgherrie Mountains, as though there had not been evidences that such a fact must have existed for centuries; but as according to the old idea that gold was only to be found in auriferous sands in the rivers, the matrix of the gold was never looked for, and until 1849 no European geologist dared venture to assert that gold had a matrix, and it was considered one of the things in creation that was motherless. When the first samples of the fact that gold had a matrix were shown by me in 1849, the fact was scouted by some of the first geologists of that day as an unheard-of thing, and a very eminent man at that time had, I may say, the impudence to tell me that the specimens I showed him had been manufactured at Birmingham, and were fine samples of ingenious manufacture from that seat of industry. Thirty years experience has given us very extended ideas of the mineral formations and deposits, and the old dictum that gold was to be found only in auriferous sands, and that it grew there year by year, is quite exploded, and that where these sands are found it must follow that there must exist in the mountains reefs containing the precious metal, the disintegration of which form the continuous renewing sources of the metallic deposits found in these sands.

Now, where the gold reefs are found at South Wynaad is on the western slope of the Neilgherrie Mountains in quartz reefs, having, I have no doubt, a course north-east and south-west, which is the direction of all the prolific quartz lodes that I have seen on the American continents, and which I believe to be the zone of the formation of the precious metals all over the world.

It is a fact that the gold manufacture of Tritchnopoli has been renowned for its beauty and fineness of workmanship for ages, as also for the pureness of the metal with which every ornament made in that country is composed. The gold from which these beautiful and delicately constructed ornaments are made is obtained from the auriferous sands of the River Cavery, which takes its rise on the east side of the Western Ghauts, and runs to the east through Seringapatam, and passing through a gorge in the Neilgherries flows through the country adjacent to Tritchnopoli, discharging its waters on the Coromandel coast. It is on the sand bars of this river where the fine gold of this country is found, and has been obtained for centuries. It is a well authenticated historical fact that gold was obtained from the Coromandel coast at the time that King Solomon built his temple, but the place from whence it was procured is not known, but it might have been from the washing of the auriferous sands of the Cavery.

Now, it is perfectly clear that where there has been such a continuous supply of the precious metal for so many centuries there must be near the course of this river many very rich quartz reefs which are acted on by the climate, and become disintegrated on their exposed surfaces, and these disintegrations are brought down during the rainy seasons, and the particles of gold thus liberated are brought down and are deposited on the sand bars of the river, the heaviest being found on the sand bars nearest the place of their disintegration, and the lighter further down the stream. This

fact is in some measure the index to the reefs from whence they have been derived; and by the careful examination of the river when the water is at its greatest depression the reefs may be found and traced, but it is difficult to find these reefs in a thickly timbered country, where the vegetable matter accumulates so rapidly, covering over the original rocks; but when they are found in the rivers, and their correct bearings ascertained, it is not difficult for one who understands his business to trace them for miles, and lay them down topographically.

It may be taken as a fact that in all rivers where there are found auriferous sands there must be gold quartz reefs near them, and by a proper investigation of the streams when they are at their greatest depression they may be found and explored.

Grove-lane, Camberwell, Nov. 20. JACKSON & BARWISE.

THE MINES OF BISCAY.

SIR,—Would the writer of the vivid and eloquent description of the Mines of Biscay, which appeared in the Journal of Sept. 21, kindly supplement his excellent paper by describing the geological age of the strata in which the iron ores occur, and the manner of the occurrence of the principal deposits of ore? By so doing he would much oblige. FERRO.

MINING IN SOUTH AUSTRALIA.

SIR,—It is some months since I forwarded you a letter, the reason for my long silence being the depressed state of copper mining, resulting from the low price of metal in the English market. Our exports of copper, which five years ago amounted to over 800,000*l.* in value, last year was only a little over half a million, and this not owing to any falling off in the productiveness of our mines but to the depreciation in the copper market. Hundreds of miners have been thrown out of employment, but fortunately there has been plenty of work in other directions—on the new railways and other public works—so that they have been able to get something to do, after a little temporary inconvenience. There is, however, still work going on at the mines, but nothing like full work, and men and agents have voluntarily proposed to take lower wages rather than go elsewhere for work. There is a new and very promising discovery of copper within 14 miles of Adelaide, and 4 from Salisbury, on the North line of railway. A lease of 60 acres for 21 years has been obtained on advantageous terms from the owner of the property, and the lodes, for there are two, are to be proved immediately. Another discovery near Pekina, about 180 miles north, has been made; there is copper, and good roofing slate. In the present state of the copper market the mine will not be worth opening so far from a port of shipment, but the roofing slate may be of local importance.

Three or four weeks ago a discovery of something resembling coal was said to have been made within 20 miles of the Burra, and at a depth of 150 ft. Since then a discovery has been made within a mile of the city of Adelaide, where from a depth of 60 ft. some carboniferous substance containing small particles of genuine coal has been raised. I can speak positively of this, having seen several large lumps raised during successive days. The substance also contains lignite and a little iron pyrites. I took an experienced Scotch coal miner to look at it; he had no interest in it whatever, unless to advise me for the best, and he pronounced the indications to be very favourable; he applied some of his rough-and-ready miners' tests to the substance, and said he was sure it was overlaying coal. In sinking a few feet lower a slaty rock, not very hard, has been struck, which my Scotch friend tells me is found in the neighbourhood of coal. This rock, of a greenish-grey colour, contains what I think are genuine impressions of ferns, and a fine thick piece of lignite, with particles of coal, has come up in a lump of the black carboniferous substance. Geologists say we shall never find coal here except at a very great depth, but the present indications seem to be worth following. If anything further is discovered you shall hear from me again.—*Adelaide, Oct.* 5. J. B. A.

MINING IN NEW SOUTH WALES.

SIR,—Now that our three different lines of railway are beginning to really open up the interior, and so cheapen the cost of machinery, stores, ores, &c., a good deal of individual private enterprise is being directed to mining, and although in nine cases out of ten the original capital is miserably insufficient to achieve any large result where extensive work is necessary, still most of them are more than paying their way, and, taught by the dearly-bought experience of past losses, developing properties sufficiently to eventually warrant the expenditure of sufficient means and time to do them fair justice, The few scattered extracts from this week's Town and Country Journal, not picked, being a fair sample of what is happening in scores of other places also:—

The Carcoar Times has been informed that rich gold has been struck in the Little Emma claim at the Forest. The prospectors were putting in a drive, and had got in about 195 ft. when they cut a lode (pyrites) 6 ft. wide. A prospect was washed out, and yielded 1 dwt. to 1 lb. of dirt; 200 ozs. to the ton is reckoned on. Quite a rush has taken place to the spot.

The Shoalhaven News reports as the result of recent returns from the Sydney Mint that the gold from Yalwal is of a very good description, the value being from 3*l.* 17*s.* 10½*d.* to 4*l.* per ounce. The Pioneer Company (Kennedy and Co.) finished their first crushing of 117½ tons at the 10-stamper battery last week, which produced 128 ozs. 7 dwts. of gold, which was forwarded to Sydney.

Our special reporter, travelling northward, writes as follows from the Barrington:—Yesterday, Sept. 9, I went up to look at the place where one of the richest prospects yet obtained on the field was taken from. They are only about 8 ft. deep, and it is undoubtedly very rich; one prospect, which was taken out last Monday, giving 17 dwts. to the dish, and 3 ozs. being got yesterday from the same quantity. It is on the Morning Star line of reef, and the gold is of a coarse description. I did not telegraph this item, because finds like these often mislead outsiders. I do not intend to say that this is not a rich field. I think that it will be one of the grandest in the colony, but there is not the slightest use of any man coming here without money.

A correspondent at the Rocky River gold field writes:—The late plentiful supply of water has enabled the miners here to commence washing up their large heaps of dirt. The Bullion Company, which started active operations only two months ago, have already got splendid prospects. They have got a face on their work showing 5 ft. of payable wash-dirt. I am exceedingly pleased to report this, as the success of this company should act as an incentive to other speculators to open up neighbouring ground, already proved to be rich, only requiring machinery to keep down the water.

Capt. Williams, of the Bensusan's Copper Mine, Frogmoor, reports:—The drives north and south at the 35 fm. level have been extended 2 fms. 6 in., yielding 41 tons 4 qrs. of ore of 12 per cent., or about 20 tons per fathom, worth 4*l.* 4*s.* per ton, or 84*l.* per fathom. This ground—from the 35 to the 25 fm. level—can be stoped out at 10*l.* to 12*l.* per fathom. In the south drive the ore has improved in quality, the last lot taken out yielding 15 per cent. on assay. Lode 4 ft. to 5 ft. thick.

The following particulars of a new discovery on the Mongarlowe gold field appears in the Braidwood Dispatch:—On Thursday last Messrs. W. Dunshea and W. Steel, who have a flooding off claim on the Red Hill, about 100 yards above the Sergeant's Point crossing, opened up a quartz reef at a depth of about 7 ft. from the surface. From half a dish of stone they obtained 10 ozs. of gold from specimens and 2 ozs. of free gold. The casing of the reef gives a prospect throughout of 1 dwt. to 5 dwts. to the dish. The vein itself is about 4 in. wide. Mr. Davies, of Sergeant's Point, exhibited some of the specimens in town the same day. They were as full of gold, to use a favourite comparison among diggers, as an egg is full of meat.

Araluen Valley is also again coming to the front—as the system of a box underground drain, introduced by Mr. C. W. Newman for his Crown and New Venture claims, saving as it does all the heavy expenses of steam pumps, renders ground payable which has hitherto lain idle, and even enables old washed ground to be again worked with payable results.

As regards alluvial and hydraulic mining generally we are ages behind our American cousins, and if they had our gold fields the Bank of England would soon begin to notice the increase of bullion from New South Wales.—*Sydney Sept.* R. D. ADAMS.

NOTE.—I see since writing the above that Bensusan's Copper Mine is just formed here into a limited liability company; part of the shares are placed here, and a part reserved to be placed on the English market. R. D. A.

OUR EUREKA, NEVADA, LETTER—THE BURNING OF THE RICHMOND WORKS.

190,000 BUSHELS CHARCOAL IN A BLAZE—THE FIRE THE RESULT OF ACCIDENT—NOBODY TO BLAME—NOBLE CONDUCT OF THE COMPANY'S OFFICERS AND EMPLOYEES—THE EUREKA FIRE COMPANIES PROMPTLY RESPOND, AND PERFORM SIGNAL SERVICE IN SUBDUING THE FLAMES—COMPANY'S LOSS A MERE BAGATELLE—LESS THAN ONE MONTH'S RUN WILL COVER IT.

SIR,—Not since the settlement of Eureka has it been visited by so great a calamity as that which marked the passage of Friday, Sept. 27 last. The burning of the Richmond Works was, indeed, a great calamity, and I have no doubt that, however inauspicious was the day that witnessed their destruction, it will, nevertheless, long continue to be a memorable one in the local history of our camp. Other places have had their Black Thursdays, so named probably in commemoration of some distressing occurrence, such as some sudden and unexpected financial crash, supplemented by a few heavy mercantile failures, or the defalcation of some trusted bank or other official, followed by his having flown to "where the woodbine twineth," with his illgotten gains and some other man's wife. This being so we, in like manner, will have our Black Friday to boast of in future, and to give us a modicum of distinction—a name and character abroad in the world. These, however, are distinctions which we would far prefer to have received from other and less distressing causes.

The morning of Sept. 27 dawned, as did other mornings doubtless in other portions of the globe, bright and cloudless, not even the filmiest nimbus appearing to mar the beauty of the etherealised and boundless expanse above us. Peeping o'er the sage covered hills, old Sol's rays, too, as they shot athwart the mountains and valleys, and gleefully danced on the rock-bound slopes of hoary-headed old Prospect, the monarch of the district, upon whose rugged brow they bestowed their usual matutinal salutations, seemed warmer and altogether more genial in their brightness than had been their wont for a few days previously. But there was nothing remarkably strange in all this, neither was it surprising that our mountain zephyrs had not till up to about 11 A.M. thought fit to inaugurate their usual diurnal frolics. But alas, this tardiness on their part was only the prelude, a sort of breathing spell as it were, preparatory to a vigorous renewal of the high carnival which they had held amidst the gloom and loneliness of the preceding night. Scarcely had the hand of the clock indicated 11·30 A.M. than the wind began to blow in fitful gusts from the north-west, and as luck, or whatever else it may be denominated, would have it it could not blow from any quarter that more directly menaced the interests of the company, and the security of the magnificent coal pile of 190,000 bushels that had been in the interim subsequent to the shutting down of the furnaces, hoarded in part for winter use than did the quarter from which it blew. In a few brief moments afterwards the writer's train of thought at the time was rather abruptly arrested by the exclamations of Mr. Glassford—one of the employees on the coal pile—"Fire! fire," and, great heavens, there it was sure enough in all its realistic fury, issuing in forked flames from under the eaves of the extreme western end of the furnace building. Calling to Glassford, I ordered him to fly and give the alarm to Mr. Titus and the engineer, who immediately thereafter blew the whistle to give notice of our danger, and to invoke both the fire companies and the citizens of the town to hasten to our assistance. The appeal was not made in vain, for at the first prolonged blast of the whistle both the former and latter came tearing along at breakneck speed to do what they could to stay the progress of the fire-fiend. Two minute after the first shrill whistle of the engine was heard, there was an avalanche of water poured on the burning building, and which, under ordinary circumstances, ought to have placed a quietus upon any blaze however powerful. And it would had not the structure been as dry as tinder, and had not the flames, which spread with almost lightning rapidity, gained such headway before they were discovered. The fire, which was purely accidental, originated in the blacksmith's shop adjoining the furnace building, on the extreme west. From there it silently licked its way to the feeding-floor, and thence to the roof, whence it issued, as stated, ere it was discovered, as noticed above. With the wind steadily blowing from the direction it did I soon concluded that without it quickly veered to some more favourable point of the compass the coal pile was doomed, for if it once became ignited its inflammable character would soon place it beyond the pale of being saved, even by water. Yet had our water not yielding to the heavy demand made upon it so early in the fight it is within the bounds of probability that we might have ultimately saved it. With the failure of the aquas fountains, however, all hope of success vanished, leaving us powerless to act, mute impersonations of direst distress at being forced to witness a spectacle which it was not in our power to prevent. In less time than it has taken to record it the huge carboniferous pile, from its centre to its extremest limits, became enveloped in a blaze, the like of which has been rarely witnessed; the flames, in their headlong course, sweeping everything before them, so that in an incredibly short space of time nothing remained to mark the site whereon a short time previously stood a stately structure, but an unprofitable waste of broken and charred timbers, warped metallic roofling, and half-burnt and blackened piles of debris, together with the three stately-looking stone cupolas, which, like lonely sentinels, mute spectators of the surrounding ruins, kept watch and ward over whatever of value had been rescued from the forces of Nature—fire and water.

But, as if in mercy to worn-out humanity, night at length spread her sable pall o'er the sickening scene, and each participant in the gallant struggle retired to his home for rest and recuperation, and, mayhap, to ponder on and philosophise upon they incidents of the day and the vicissitudes of fortune. And what fortune and what a scene, in contrast with the morning—the twinkling stars looked down upon that memorable and murky night. Fortunately for the town the wind entirely subsided toward sundown, and by the time Mr. Titus had set the watch for the night all Nature had become hushed in repose. Not so with the burning coal-pile, however, for that, like Dante's Inferno, moved apace, shooting forth its lurid flame, in long spiral picturesque columns, which dispelled the gloom, and turned night into day, outlining every hill, rocky promontory, shrub, house, or other object as clearly as if reflected in the full glory of the noonday sun.

During the progress of the fire there took place many scenes and incidents of a stirring character, which, did space allow, would be eminently worthy of being recorded. But since it does not I will content myself by stating that the company's officers and other employees present exercised to the utmost of their power every function of their nature on behalf of its interests. They could do no more than they did had the property been their own. This sentence applies with especial force to Mr. Titus, the company's efficient foreman, upon whom, in the absence of Mr. Rickard, devolved the onerous duty of directing the operations of those present. Mr. Morrison, too, the company's secretary, was everywhere a conspicuous figure, stimulating others to do their duty. As for the writer, his inate modesty prevents him from eulogising himself. Mr. Rickard who, with Mr. Wren, left that morning on a flying visit to a neighbouring district, returned towards evening, having been recalled by wire soon after the breaking out of the fire, and though his presence at the time of the occurrence of the fire would not materially alter the state of things, I never saw anybody so painfully disturbed as he was after he had returned and viewed the extent of the disaster. Mr. Rickards is a faithful and painstaking officer, as the results which he has lately accomplished abundantly prove. Not since the fire which laid waste Virginia City, more than three years ago, has there been a more disastrous conflagration than the Richmond one. However, the actual loss, whatever it may amount to, will be greatly diminished by the values of the 75 or 80 tons of high-grade bullion which has been extracted from the interstices of the furnace foundation, and which is now piled up in the yard preparatory to being run through the reducing furnace in the refinery. Less than a month's run of the new furnaces, which are expected to be completed at an early day, will cover the residue of loss.

Deeming this letter already long enough I refer your readers to your next week's issue for the remainder, which I hope will relieve them of any apprehensions which they may have entertained regarding Richmond affairs. J. D. POWER.

Eureka, Nevada, Oct. 28.

DON PEDRO NORTH DEL REY GOLD MINING COMPANY.

SIR,—It is very disheartening to find the monthly returns from this mine continue so very unfavourable. I had hoped long ere this to find a considerable improvement in this respect, but like my fellow-shareholders am doomed to disappointment. Not being a director, and, therefore, but imperfectly acquainted with the practical working of the mine, I am unable to form an opinion as to whether Capt. Vivian is the right man in the right place, but I do think under the present circumstances the directors might forego half their customary fees; that same reduction might be made in the salary of the manager till such time as the mine became again self-supporting, and also that the strictest economy should be exercised by the board in London, as well as by those in authority in Brazil. It is only recently the shareholders have had to pay a call of 2*s.* per share, which came very unexpectedly upon them, and which no doubt many these hard times, like myself, could but ill afford, and I fear unless my suggestion be carried out we may be called upon further before very long. When times mend with us I would be one of the first to deal liberally with all who have helped forward the success of Don Pedro, but at present I am an earnest advocate for the most rigid economy. A SHAREHOLDER.

Nov. 21.

CONSUMPTION OF FUEL FOR MINING ENGINES.

SIR,—For the attainment of the greatest economy of fuel consumption by mining engines the boiler is the chief consideration, for though high-pressure steam may be used with a great degree of expansion in the cylinder, and condensing apparatus may be attached to the engine, after all the main source of economy will be found to be in the kind of boiler used in connection with the engine, whether the Cornish, Lancashire, multitubular, or common cylindrical type be adopted, with a view to economy in fuel. Frequently the cylindrical boiler is adopted from long usage, and not from any merits of its own with regard to safety and economy; this applies to districts more particularly where coal is cheap and abundant. In mining districts such as Cornwall, where fuel is expensive from the great distance it has to be carried, great care is required in the selection of boilers in order to obtain the utmost amount of evaporation from a given weight of coal.

In my last letter it was shown, from experiments made with multitubular boilers at Cardiff, that those boilers whose furnaces gave the most rapid consumption of fuel did not evaporate the greatest quantity of water per 1 lb. of coal, but those with a much slower combustion, relatively to size of fire-grate, gave the best results, the boilers being constructed to absorb the largest amount of heat from the fuel. In mining districts it is of the greatest importance that proper tests should be applied to the different forms of boiler so as to determine the relative economy in the evaporation of water per 1 lb. of coal, whether the multitubular, the two-flued boiler, with Galloway's tubes, or the one-flued Cornish boiler, is tried; to the latter the addition of Galloway's tubes will be found an advantage, and they can readily be applied by the makers to existing Cornish boilers.

Experiments were made with a double-flued or Lancashire boiler, 28½ ft. in length, 7 ft. in diameter; each flue is 2 ft. 9 in. in diameter in the larger rings, and 2 ft. 5 in. in the smaller rings; each tube has four Galloway's tubes inserted; fire-grate, 16 ft. area in each tube. The products of combustion passing through the tubes are brought under the boiler to the front end, where they are divided and pass along side flues to the chimney. The boiler was well covered with a non-conductor of heat, and a shed erected over it to keep it dry. Over a period of six hours the fires were supplied with small coal and fed with cold water.

	Lbs. of water.	Lb. of coal.
The evaporation was	7·7 from	1
Coal burnt per square foot of grate, per hour 15·7 lbs.		
The same, supplied with small coal and fed with water at 190°	8·34 evaporated by	1
Coal burnt per square foot of fire-grate per hour, 12·3 lbs.		
In same time, supplied with large steam coal, and fed with hot water at 190°	9·44 evaporated by	1

Coal burnt per square foot of fire-grate per hour, 13·6 lbs. Heat, 580° at end of flue near chimney. Steam pressure 45 lbs. per square inch in each trial. The theoretical evaporative power of steam coal is from 14 to 16 lbs. of water from 212° by 1 lb. of coal, so that the last trial is little more than 67 per cent. of the full effect of the fuel.

Another experiment with a Lancashire boiler of the same size, but with the heat passed over the top of the boiler at a reduced temperature in a chamber, gave the result of 10·4 lbs. of water evaporated per 1 lb. of coal, small coal being used, fed with hot water. With best steam coal, and fed with hot water, the result was 11·2 lbs. of water evporated per 1 lb. of coal. The coal used in the above experiments was got from the Derby coal field.

Other experiments made with Lancashire boilers at Barrow, 33 ft. in length, fired with Wigan steam coal, supplied with hot water, the heat also carried by flues over the top of the boilers before entering the chimney flue, gave results with best coal of an average evaporation of 10¾ lbs. of water per 1 lb. of coal, and with small coal 9 lbs. of water per 1 lb. of coal. It thus appears there is an advantage gained in evaporation by heating the top of the boiler, the result being an increase upon that obtained by the ordinary method of setting, and covering the top with a non-conducting composition, and a shed built over all.

In addition to the three forms of boiler named, the Elephant form of boiler is found to give good results in evaporation; two tubes below the body of the boiler are enclosed each in a flue; the water heater is also placed in a flue. The result of comparative experiments with a Lancashire and an Elephant boiler are as follows:—With Lancashire boiler, coal consumed per square foot of grate per hour, 18·5 lbs.; water evaporated from 212°, 8·94 per 1 lb. of best steam coal. With slow combustion in the same boiler the coal consumed was 10·15 lbs. per square foot of grate per hour, and water evaporated from 212°, 9·29 lbs. per 1 lb. of best coal; steam pressure in each case, 68 lbs. per square inch.

With an Elephant boiler having the same area of grate, and fired with the same kind of fuel, 20 lbs. of coal per hour per square foot of grate evaporated 8·6 lbs. of water from 212°. With a slower combustion—11 lbs. of coal per hour per square foot of grate—the evaporation was 8·97 lbs. of water at 212° with 1 lb. of coal; steam pressure, 68 lbs. per square inch.

Another description of boiler is now largely used—those composed of small tubes, generally called sectional boilers, of which the Howard and Root boilers are best known types. The Root boiler is used largely in England, on the Continent, and in America, and generates steam up to 150 lbs. pressure; steam is raised rapidly in these boilers; in half an hour steam at 80 lbs. pressure can be raised. If one of the tubes burst it only puts the fire out, and no injury to any person, it is said, has occurred in using them. A point to be attended to in sectional boilers is the cleaning of the tubes; unless the water is fairly good they should not be adopted; that form of them is best which can be readily inspected and cleaned. A representative of the Engineer obtained 12 lbs. evaporation of water from 1 lb. of best coal by one of Root's boilers; the ordinary evaporation is 9 to 10 lbs. with 80 lbs. steam pressure.

If cylindrical boilers are pressed at 45 lbs., Cornish or Lancashire

boilers at 60 lbs. per square inch, it is a question whether the use of sectional boilers, and steam at pressures from 80 to 150 lbs. per square inch, is desirable for mining engines. It is well known that high-pressure steam is the most economical, and many of the Root's boilers work at 150 lbs. pressure, but steam at this pressure is far beyond the present practice of engineers as applied to mining engines.

Nov. 19. M. E.

NEW ARTIFICIAL FUEL COMPOSITION.

SIR,—It is not very long since that in referring to a deposit of tender coal, not far from a fine bog of peat in the south-west of Ireland, it suggested that the two should be ground up and agglomerated, and a sample of the compound which I made burned extremely well, and gave out great heat, but I must acknowledge there was a very strong smell from it, owing to the coal tar which was used as the binding material. I have, however, just noticed an invention which promises to remove the difficulty, for the inventor—Mr. Charles Nory, of Paris—claims to be able to deal with bituminous coal for the manufacture of compressed fuel, and if he can do this I do not see why I—his invention not being patented in England—could not adopt the same process for my mixture of tender bituminous coal and peat, and thus turn great wealth, now latent, to account. The agglomeration of small coal with coal-tar pitch has the objection of increasing the amount of smoke produced, and in the case of coal of a smoky nature such mixture is unfit for use. Coal-tar pitch, which is the agglomerating agent most commonly employed, has also the further objection that it fails to sufficiently agglomerate bituminous coal when used in the same proportions as for non-bituminous coal. For example, Cardiff coal may be agglomerated with from 6 to 8 per cent. of pitch, but Newcastle coal requires from 10 to 25 per cent. of pitch, the degree of compression being the same in both cases. With such an addition of pitch, however, the unpleasant odour and smoke evolved during the combustion of the coal would be insupportable. For this reason only those varieties of coal which are relatively non-bituminous could be advantageously agglomerated hitherto. The same objection applies to the use of coal tar instead of its pitch. The agglomerating material proposed by Mr. Nory is a sort of double soap, consisting for the most part of native asphaltum—here would be a chance of utilising the Trinidad pitch lake—whereby the objections to the use of coal-tar pitch are obviated. Asphaltum alone cannot—this I have learned to my cost before the date of Mr. Nory's discovery—be advantageously employed as an agglomerating agent, being a substance which melts at too high a temperature, and, moreover, its agglomerating power even at a higher temperature is insufficient, the agglomerated products being friable, and possessing no cohesion or solidity when cooled. It has been found, however, by experiment that asphaltum is capable of being dissolved in a solution of soap, and of being partially held in suspension therein. With a certain quantity of water, which also enters into combination, a compound is obtained of the consistency of coal tar (at 100 C.), but which has none of the disadvantages of the latter. This aqueous tar or soap emits no disagreeable odour, and burns when mixed with small coal without producing any additional smoke, this advantageous quality being apparently due to the small quantity of alkali which it contains, which does not, however, cause any objectionable increase of ashes, as it is not necessary to employ more than from 5 to 7 kilogrammes to every ton of coal.

The soap cement would, apparently, be as cheap an agglomerating material as any that has been proposed, and it should be premised that all soaps having a base of potash or soda are suitable for use with native asphaltum or bitumens, the cheaper kinds being preferred. A cheaper primary soap may be made of common resin, arcanson, or colophany, or of saponifiable oils of coal tar or petroleum, such as creosote, phenal, and others; but I will describe the manufacture of the soap cement obtained by combining either natural Seyssel asphalte or Trinidad asphalte with a resin soap, as it is the most complex example. For 1 ton (1000 kilos.) of small coal, 5 or 6 kilos. of dry carbonate of soda are dissolved in from 20 to 30 kilos. of water, to which is added 10 to 12 kilos. of common brown resin. The whole is then boiled in an iron vessel having a capacity of from 300 to 400 litres, and stirred from the time ebullition commences until the whole of the resin is dissolved in the alkali. Resin having, as is well-known, the property of expelling the carbonic acid from carbonates, it is unnecessary to employ caustic alkalies; but if phenal or creosote be used instead of resin it would be necessary to first decarbonate the alkali, which may be done without much expense. After boiling for a few minutes a resin soap is obtained, and a double soap is then formed by adding from 50 to 60 kilos. of asphaltum in small lumps, or preferably in powder, and also from 30 kilogrammes to 35 kilogrammes of water, and again boiled and continually stirred. When the asphalte begins to be dissolved from 10 to 20 kilos. more water are added, the boiling and stirring being still kept up, and after about twenty minutes boiling the water will for the most part be combined with the other substances, whereupon the soap cement is obtained fit for use, and forms a solid mass when cooled. The compound is used by pouring it while hot upon the small coal to be agglomerated, and then kneading the whole together and moulding as in ordinary. It is, however, of advantage, in order to ensure a thorough mixture suitable for compressing, to commence by heating the coal to a temperature of from 90° to 100° C., to place it in the mixing or kneading machine to run upon it the coap cement maintained at a temperature of 100° to 110° C. to ensure the necessary fluidity. The mixture should not be allowed to cool before being placed in the press moulds.

The proportions of the different materials vary, Mr. Nory says, slightly with the kind of coal and size of the agglomerated blocks, and from this I should assume that, in order to find a suitable soap for agglomerating the Irish coal and peat, would only involve the making of a few experiments. It has before been stated that the saponifiable heavy oils of tar may be substituted for the resin. These oils, such as creosote, phenal or carbolic acid, cresylic acid, trichlorophenic acid, and others, are dissolved in the soda or potash with which they form a soap by saturating the alkali; the asphalte is then added, and after boiling a few minutes a soap cement is obtained. For example, to 5 kilos. of soda dissolved in 40 to 50 kilos. of water are added 10 to 12 kilos. of oil, and the whole heated and boiled until completete saponification. From 40 to 50 kilos. of water are then added, and from 50 to 60 kilos. of asphalte, and the whole is again boiled until the mass attains the desired consistency, and the soap cement is produced. These proportions of the several ingredients vary according to the nature of the oils or mixtures, and of the coal and the size of the blocks to be produced.

If it be desired to substitute a soap having a base of lime, magnesia, alumina, oxide of iron, or other earthy base, it is simply necessary to add to the soap cement made with potash or soda one of these earthy bases, or one of their salts, whereby the former base will be eliminated and the one added substituted therefor; this addition of lime, magnesia, or alumina, or a salt of those bases, however, presents no advantage except in the case of bituminous and pyritic coal, which are more difficult to agglomerate, and whose combustion is improved by the presence of an alkali or solid oxide. In any case the presence of a soluble or insoluble alkali in a pyritic agglommerate would have the effect of preventing the instantaneous combustion of the fuel if this combustion is due to the action of the air on the pyrite.

Mention has been made of purified asphalte, but it will be understood that crude asphalte in its natural state may be used, provided it does not contain too large a proportion of foreign matters, which would cause an excessive increase in the quantity of ashes. In this case the proportions are varied—for example, Trinidad bitumen or asphalte contains in its natural state about 30 per cent. of earthy matters, and if it be used in this condition without being purified 8 per cent. of small coal should be used instead of from 5 to 6 per cent., as before. Other matters may also be added to the soap cement, such as the more or less solid residues of the manufacture of shale, boghead, or rock oils, and kinds of artificial asphaltes very different from coal tar and pitch, and which like natural asphalte may be formed into a double soap by then mixing with any alkaline soap. The product known in commerce under the name of Vulcan oil may also form an ingredient of the first, or alkaline soap, as well as of the second, or double soap, when accompanied with a certain proportion of asphalte. Lastly, there are some qualities of non-bituminous coal which combine better with pitch and tar than the bituminous kinds, and the above agglomerating agent may be employed with these, as well as with mixtures of different kinds of coal, with the addition of more or less pitch or tar.

Now, if this soap cement could be used with the mixture of coal and peat, to which I have referred, I believe one of the finest fuels that could be placed in the market for locomotive and general purposes, and as the deposits to which I allude are close to a railway, which is at present using imported coal, I should think a very good business could be established.—*Paris, Nov.* 16. HIBERNICUS.

ECONOMY IN FILLING SKIPS.

SIR,—I beg to render my sincere thanks to "J. J.," who, in the Journal of the 9th inst., gave me such very valuable information, as I am one of those who endeavour to make knowledge (coming from whatever source) profitable to myself and those around me. And, if "J. J." will trouble himself so much, I shall be obliged for still further information. I would wish him to state the name and class of mine in Cornwall where he said a similar apparatus was at work 16 years ago; also, if convenient, to give an account of the advantages won, and, if any, the disadvantages experienced—for I assume from what he states alone that the advantages must have been great, inasmuch that they led him to adopt the same plan 10 years later at Winford, in Somersetshire. And, although he says "chokes sometimes occurred" by the falling of the stuff through a distance of 8 ft., I should think that these would only be hindrances of importance in cases where the same stuff is of a clayey nature.

I may say that I am a Cornishman, and have never seen or heard of such a plan being adopted for filling skips, and doubt not but that there are a great number of Cornishmen like myself; therefore, I ask not only "J. J." but all those gentlemen who know by experience the merits of demerits of the system to favour the public with their knowledge.

When I sent in the article for the Journal of Nov. 2 I did it under the impression that it was new, and that it might contribute something, however little, to economise the working of some of our Cornish mines, economy being the question of the day—so that if "J. J." was right in his assumption that the question occupied my "time and attention" for such a long period I should consider that it was devoted to a good cause, and not to be ashamed of if it took me longer thinking over and writing than even "J. J." seems to intimate. In answer to his question I have to state that as yet I have had no opportunity to try the plan; but, as one who makes use of leisure hours, I often find my studies turned on subjects that are likely to become at any time of use to those who employ me, as well as to myself.—*Bailen, Nov.* 16. HENRY BREWER.

THE GREAT NORTHERN RAILWAY.

SIR,—My correspondence in last week's Journal shows the workman travels on the German railways at one-third of the fare illegally extorted from the working classes in this country, which enabled the numerous German engineers from the central and most remote parts of Germany to invade the North of England a few years ago, and more recently the German masons the Metropolis. The English workman is prevented, by the exorbitant fares, seeking employment at a distance—a national disgrace—which, if not meeting with redress in the present critical state of this country, it is feared may lead to a socialistic movement in harmony with a widespread disaffection on the increase on the Continent, not confined to an area from the Wolga to the Vistula, and the White to the Black Sea, but deeply rooted in another "malum gesto imperio," rendered apparently only homogeneous by means if not surpassing, at all events analogous, to the treatment of Poland. In Belgium the workman travels by rail at less than ½d. per English mile, the State railway system at this rate earning 5 to 6 per cent. net profit. For the information of landowners the value of land consequent upon a reduction of fares has risen 30 per cent. But let the employers of agricultural labour at the present juncture in this country hearken to a report on the agriculture of Belgium, which states:—"The agricultural labourers are enabled with the reduction in railway fares to travel to the manufacturing districts in search of work, which they obtain with an increase of wages to the extent of 20 per cent." The oldest and most experienced Railway General Manager in the United Kingdom at a meeting of the Society of Arts "demurred to these low fares as ruinous." The Minister of Public Works in Belgium report states—"The inconsiderable deficiency arising from the reduction of fares is yearly disappearing." Five to six per cent. per annum net profit, as precited, being earned by the State Railways, simultaneously with the lines of private companies, constructed at far lower cost, with fares double and treble, often almost on the verge of insolvency. In Germany as much as 24 per cent. dividend has been returned at infinitely lower fares than in England, and at the disadvantage of a sparse population. The Metropolitan Railway, costing twenty times as much as the other railroads, carries under competitive circumstances passengers at ½d. a mile. The Proceedings of the Society of Arts confirm all the aforesaid statements. The recklessness with which the directors of certain leading railways have engaged in subsidiary undertakings, or in the construction or purchase of branch lines, many of which have been attended with heavy losses, has had a powerful influence in depressing the value of railway property.

Some leading directors have turned out nothing but gigantic swindlers, and all railways have suffered more or less from the discredit and suspicion attached to railway boards. A great work remains to be done before the management is placed on a satisfactory footing. Such is the language of McCulloch's 1875 Standard Edition, p. 1164. The General Manager of the Midland Railway, at a meeting of the Society of Arts, declared "railways were in every way made the objects of plunder." In his evidence before the Royal Commission respecting the internecine coal traffic war with the Great Northern Mr. Allport stated—"Railway companies are very guilty in their contests with each other of starting useless lines, bringing no dividend, many of which have been made from contention, causing a distinct pressure upon their resources." We shall in due time have revealed *in extenso* the cost of the aggressive inroad by the Great Northern into Nottinghamshire and Derbyshire, and the working of same. The general report of the Board of Trade of July 8, 1878, states—"The increase of capital is considerably higher than that of the mileage open for traffic, and so far confirms the suggestion that a considerable part of the increased capital of railways is expended on lines already open." The Railway Times of Oct. 19 states—"An accusation has been made against the Great Northern of paying dividends out of capital." Under what category does Mr. Allport—when informing the outside world of the cost of railways being weighted with so much plunder—rank the action of the Great Northern entailing such immense legal and parliamentary expenses on the shareholders, and indirectly on the public, by their 1878 parliamentary campaign? With such a heavy drain on their resources in attaining the consent of Parliament to their Lincoln and Spalding Bill, which I am informed has to remain a dead letter, has the proposed transit of Yorkshire, Derbyshire, and Nottinghamshire coal by sea, *via* Boston or Keadby, at a saving of 5s. per ton on rail transit to London and attendant expenses, not taking into account return goods traffic at a purely nominal rate, cast dismay into the council chambers at King's Cross and Liverpool-street, arresting all progress. It may well do so, as there is nothing to prevent the seaborne coal traffic plan being carried into effect with precited result, displacing the entirety of the Great Northern coal traffic to London, and equally so of the vaunted "green peas to the colliers supply line," which latter traffic they will not be interfered with, but the aforesaid coals will be delivered into all their seaports and inland towns as Norwich, &c., and London, at infinitely lower rates than is possible for them to effect by rail. The coalowners will, in my correspondence, have an earnest of such undertaking being carried out, notwithstanding the antagonistic influence brought to bear against it. The interests involved are too gigantic to b swayed by other than the merits of the case, the most rigorous in vestigation of which has been courted. Shareholders in the Great Northern will do well to ponder seriously over their position. The shareholders of the City of Glasgow Bank little dreamt of their impending ruin, and the "actionnaires" of the Banque de Belgique have been victims to the mal-administration of the executive. It will be the fault of the Great Northern shareholders if they do not satisfy themselves as to their position. Without fee or reward, or the remotest prospective advantage, I am in a position to open their eyes to their "super abyssum ambulantes" state.

WILLIAM JOSEPH THOMPSON.

6, *Fitzwilliam-road, Clapham, Nov.* 19.

THE WHITBURN SINKING FOR COAL.

SIR,—The operations here been successful so far—the first shaft having been put down by the Chaudron system through the water-bearing strata, which is here the magnesian limestone. A small layer of sand generally underlies this limestone, which produces enormous quantities of water, and, no doubt, this water has its origin in a sort of subterranean lake, which extends over a considerable area in the county of Durham. The depth to this point is about 75 fathoms from the surface. In addition to the usual sand-feeders water is generally produced in abundance from fissures in the limestone; but in this case at Whitburn the amount of water met with was far in excess of the quantity met with at any other sinking in the locality. The cause of this unusual quantity of water is generally attributed to the close proximity of the shaft to the sea. The sinking of this shaft was continued by the ordinary method until a depth of 27 fms. from the surface was reached, and the quantity of water pumped exceeded 10,000 gallons per minute, and, as the shaft bottoms could not be kept clear even when lifting this enormous quantity of water, the sinking by this method was finally abandoned. Sinking by the Chaudron system was then commenced, and this has proved successful.

The next operation is to insert the iron tubing in the shaft, and this, of course, will extend from the surface to the foundation formed for it at the bottom of the water-bearing strata. The iron tubes are cast in rings the size of the shaft, and screwed together as they are inserted—the joints at the junction of the rings being made watertight. A water-tight cap is also fitted to the bottom end of the tube, and then the tube floats—otherwise the weight of the iron tube would become enormous, and it would be scarcely possible to lower such a weight by chains—as it is the only difficulty met with is to sink the tube, and this is effected by a pipe, which is carried through the end tube, and water is admitted through this pipe in sufficient quantity to sink the tube as required.

When this process is completed it will only be necessary to lift the water by tubs standing inside the tube, and then sinking through the coal measures will be carried on by the usual method.

In doing this, however, all the modern improvements will be introduced, and some original arrangements also will be carried out, which are expected to greatly facilitate the sinking operations.

By the old method of sinking by hand-labour the holes for blasting are drilled by this system, and only a few—say, two or three—holes fired at one time by means of fuses; but in this case it is proposed to drill long holes round the entire circle of the shaft, and to charge those holes with dynamite or gun-cotton, and explode them simultaneously by means of electricity.

Experiments have been made in a limestone quarry in this district for some time, with the view of ascertaining the best mode of carrying those operations out. Both dynamite and guncotton, and also various kinds of cartridges, have been experimented wih. Glass cartridges have been tried and water steming, and it appears to be highly probable, if not certain, that when those are used and the charges are fired by electricity, these charges would not explode gas, supposing that an accumulation of it should occur in the shaft. It is, therefore, highly probable that the shafts will be sunk at a rapid rate by this method, and greater safety will also be ensured.

From a paper read before the Midland Institute, on Wednesday, I observe that Mr. C. Walker, of the Houghton Main Colliery, has had some experience in the improved mode of sinking. He says that at that place, in 42 weeks, they sunk and bricked 375 yards odd—an average of nearly 9 yards per week. He says that he has no doubt that in dry sinking, with a pair of 26 in. winding engines, an average of 10 yards per week might be done and bricked, and the cost, including all stores and wages, would be about 5*l.* per yard.

Looking at the position of the Whitburn adventure at the present time, therefore, there appears to be no doubt that the coal seams may be reached thus by the end of the year 1879, should the strata prove to be similar to those met with at other shafts in the locality.

It must be noticed that in the case alluded to at the Houghton Main the holes were drilled by hand labour, and these might possibly be made by a machine at a much more rapid rate. Machines might certainly be used for this purpose in a vertical shaft, although it would be necessary to remove the machine a certain distance when the charges were fired.—*Gateshead, Nov.* 15. ENGINEER.

THE MINING INTEREST, AND THE LABOUR QUESTION.

SIR,—The wages question is in reality a very simple one, notwithstanding the laboured efforts of interested agitators to surround it with difficulties. A. B. wants to employ a hundred men; he goes into the labour market, and finds only fifty. In that case the labourer has the advantage in arranging terms. If he finds two hundred men unemployed A. B. has the advantage in arranging terms. When every labourer is well employed there is good trade, wages rise, and prosperity seems to shine like the sun. If thousands and tens of thousands are unemployed bad trade is implied, and capitalists or the employers of labour have to regulate wages to suit the depression. These simple facts can easily be understood, and applied generally or specially. As to strikes, they are simply unmitigated folly. If the employed are dissatisfied with the rate of wages they are receiving never strike, but work on, and seek by every fair, honourable, and peaceful means to adjust the difference with the employers. Strikes are hurtful to both employer and employed, but especially the latter, as every protracted strike most clearly demonstrates. A spirit of mutual conciliation and a feeling of confidence all round can never fail ultimately to accomplish a fair and equitable adjustment of all wages disputes. This question and the correlative one of the entire abolition of Saint Mondays lie at the foundations of a sound and healthy condition of things in trade.

When in Cornwall I was much struck with the splendid physique of Cornishmen. They are model men for work and doing. A Cornishman looks like a clipper; he is built up as a whale; he treads the ground like a Colossus. One sometimes meets with simpering fellows who are only half men—the other half, why we cannot tell what it is—but a Cornishman seemed to me just the sort of man to stand his ground—just the kind of man to vanquish a foe or to do battle with Nature in the crust of the earth as coolly as if he were smoking a pipe. They are good material—pluck, energy, indomitable perseverance, never-say-dieism. I thought—Cornwall will not be behind in working hard and well when the present depression turns away. Fairly and honourably dealt with as man ought to deal with man, I thought I should like to have the managerial command of an army of miners, and I would guarantee we would get along together without resorting to foolish and suicidal strikes. What a field do Cornwall and Devonshire present at the present time for the profitable investment of capital. What a pity it is to see the splendid fields of china-clay, "white unto the harvest," so extensively closed by bad times and bad trade. It was painful to see fine stalwart respectable men, as civil as princes and courteous in their bearing as gentlemen, looking out for work. I wonder whether capitalists, who keep their millions and millions locked up, have been studying and believing Mother Shipton's prophecies—that the world is to come to an end in two years! The commercial world is getting purged of many bad elements, and it will be a great step in the right direction when all trading, mining, and commercial adventures and business are carried on on sound and safe principles. If, coincident with such a development of trade, thrift were to become common to all who earn their bread by the sweat of their brow, if intemperance were to cease in the land, and if expenditure on the part of the middle classes were on a less extravagant scale—

if men were not so much in haste to become wealthy by one bound—surely, with such demands as we may hope to spring up in various parts of the world, notably Africa, where present enterprise might extend the boundaries of commerce almost indefinitely, if the Eastern and Indian question were in the hands of wise, prudent, and discreet counsellors, why should we not look for a return of prosperity, happiness, and peace? The capital of the country cannot be said to be diminished to any serious extent. The City of Glasgow Bank failure is a dreadful blow, but if the working classes, who spend 96 millions a year in intoxicating drinks, were to stop drinking to the extent of 90 millions, and that vast amount of money was partly accumulated, and partly spent in clothing, food, &c., what a vast demand for home trade would spring up. What a bright era might dawn for miners if their savings—say one-tenth—were devoted to investment in sound and safe mining adventures! Bad as affairs are, gloomy as prospects seem to be, the people of this country have a talismanic power to change the "garments of praise for the spirit of heaviness." To will is to do.

The Cleveland district is just now oppressed with bad times, and yet there despondency need not settle too deeply. If all we hear is true, the Cleveland district will soon take a position in steel manufacture second to none in the world. When the day arrives, and I am assured it is not far distant, that Cleveland pig can be converted into steel more economically than steel is now made from the best hematite pig by any other process, we shall have a revival of trade there which will astonish the mineral world. But I must close.

Ulverston, Nov. 20. F. G. S.

SIGNALLING IN MINES.

SIR,—The idea of making use of an air-compressing apparatus for the purpose of conveying audible signals has several times been brought forward, but owing, it is said, to the difficulty of connecting up the joints it has never come into general use in mines. Mr. A. Haberstolz, of Berlin, has, however, invented an improved coupling arrangement for the ends of the tubes, allowing of that sure and safe connection which has been wanting. The coupling of the pipes is composed of india-rubber, lined with a cotton fabric. The nut is screwed over an inside piece composed of two parts, the latter being at its outside screwed so that either the male or female screw can be used—that is to say, the tubing is attached to a male screw union, and a female works over the male from behind, so that when the two parts of the joint are brought together the male can project so as to take into the two females, or the female can be brought over so as to cover part of two males. The male screw piece has a conical orifice, into which fits a plug, which is kept in its seat by a spiral spring. When a connection is made the points of the plugs come together, and each is pushed backward, so that the conical valves are opened, and the air permitted to pass. The advantage of this for mine work is obvious; the main tube being laid in the mine, and half couplings being provided at intervals, the necessary communication could be established almost instantaneously, and by the use of a simple code there would be no difficulty in giving the most accurate directions by means of the signals.

With regard to the other part of the apparatus or compressor it is of very simple construction. In a small box is fixed a cylinder, in which again an india-rubber balloon is enclosed; the air contained in this balloon will become compressed by pulling at a button until a valve becomes opened, and allows the air to escape through a pipe connected with the main pipe. A sudden pressure of air is hereby produced in the pipes, which is sufficient to disengage the stopping arrangement of a bell or clockwork or ringing arrangement, whereby, consequently, the requisite official can receive audible signals. By letting go the button a spiral spring acts on the lever, the valve becomes, consequently, shut up again; at the same time the balloon expands again, and draws the air through a cross-cutting formed underneath piston-plate, forming, therefore, with it an aspiration valve. Through the automatically opening and closing of the valve by giving the signals the means are provided that the current of air goes only through the main tubing, while all sideways to the balloon of the other compressing apparatus remains closed up for it. It will easily be seen that this apparatus will find its manifold applications for giving signals in mines or many other like places as for hoists and lifts in shafts, manufactories, buildings, &c., or for similar purposes, and wherever signals may be required, even if the general disposition or arrangement had to be modified accordingly. The apparatus is said to answer well in practice, and is well worth a trial in the mines of this country. C. H.

Soho, Nov. 18.

ROCK DRILLS.

SIR,—I have read with some degree of pleasure the statements in various local papers, and also the one in your valuable Journal of last week, relative to the trials of the rock drills at the Cornwall Mining Institute, held at Dolcoath, Camborne, on the 7th inst., and so far as one can judge from the interest that was taken by the gentlemen connected with the mining interests in Cornwall, they would seem to have awakened to the fact that their system of mining must undergo a complete change in order to pay dividends. They must adopt rock-boring machinery in general.

Amongst those present at the meeting were the well-known mining engineers, Mr. Hocking, from the West Basset, Capt. Teague, Capt. J. Thomas, and others. I need not repeat the order of working of the different rock drills. Much has been said on different occasions both by the owners of the Eclipse rock drill, and others, as to the merits of that machine, and having heard that several drills were to compete before the Mining Institute, I took the opportunity of witnessing the operations. What struck me most forcibly was the great disparity of size between the three drills that entered the list as competitors against the Eclipse drill, which certainly only looked like a toy against the others. The Barrow, I was informed, had a 4 in. cylinder, as also had the Brydon and Davidson; the McKean drill had a 3¼ in. cylinder, whilst the Eclipse drill had only a 2½ in. cylinder, and all used about the same sized drill bits. Then, again, the larger drills had a much higher pressure of air—the McKean, for instance, had 60 lbs. pressure, whilst at one time I saw the Eclipse working with only 25 lbs. pressure. All this sort of underhand work seemed to emanate from the subordinates at the Dolcoath Mines, where the trial took place; but, in spite of all the little tricks played, the Eclipse drill proved itself far superior to any of the others, notwithstanding they took good care to put the Eclipse drill upon the hardest and most awkward stone to penetrate.

It is to be hoped that if the Mining Institute of Cornwall invite proprietors of rock drills to attend their meeting next year those whose duty it is to see the trials carried out will do so without partiality to any drill. I may mention that whilst in the neighbourhood I heard that the Eclipse drill was being used at the West Basset Mines with very great effect, as also the Reliance air compressor. I am sorry I did not have the time to pay a visit to the several mines in the neighbourhood of Dolcoath to see the different drills at work.—*Highbury Park, Nov.* 20. H. WILLIAMS.

ROCK-DRILLING MACHINERY.

SIR,—I must crave space for a few lines in reply to the letter of Messrs. Hathorn and Co. in last week's Journal—itself in answer to mine in the previous one. Those gentlemen ask me to obtain the Blue Book (Eclipse Rock-Drill, Elliott—De Pass, No. 629, A.D. 1878), and carefully study the specification in conjunction with the drawings. This specification was before me (as it is now) when I wrote my last letter, fully one-half of which consisted indeed of extracts from it. I beg now to repeat my question as follows:—In what respect does the arrangement claimed in the third claim—the use of ports, arranged in the valve-box substantially in the manner shown, being carried across to opposite ends of same, so that the exhaust steam or air from opposite ends of the valve may be controlled by the groove or recess in the main piston, as herein described; and in the fourth claim, which it is said constitutes a very great improvement in the invention, the means employed for controlling the valve by the exhaust steam or air from opposite ends of the valve-box, and without having any connection with the steam or air which is in either end of the main cylinder, substantially as herein described—differ from that described in my specification (No. 3342, A.D. 1875), which I need not re-quote? That the two are totally unlike has been scarcely "proved beyond all doubt at the Paris Exhibition and other places by the most scientific men of the day," unless these most scientific men had before them my specification for comparison, which Messrs. Hathorn and Co. do not allege to have been the case. I do not suggest for a moment that the patentee intentionally borrowed any ideas from me; I only assert that probably from inadvertence the similarity amounts to identity, and I say that I or anyone else am at perfect liberty to construct rock-drills according to my said specification, and this I am quite prepared to do, and in doing so to reproduce the Eclipse drill.

Messrs. Hathorn and Co. do not refer to the final paragraph of my former letter in which I show that the subject of their fifth claim is shown in my patent No. 2013, A.D. 1875 (the rock-drill which I am now so successfully using in preference to the former one, and that which you were kind enough to describe in the article in your last number upon my cheap air-compressor). Are they aware that if I am right this would invalidate their patent in its present form? I shall be happy to show and explain the specification and drawing of Elliott's patent and my own to any of the most scientific men of the day, or others who may be interested. E. EDWARDS.

Southampton Buildings, Nov. 19.

TIN, AND ITS EVER MULTIPLYING USES.

SIR,—At the present moment, when some amount of extraneous interest has been excited with regard to tin, a full account of the thousand and one uses to which this metal has been, and is continually being, applied would be exceedingly interesting. Such an account would be of service, too, as it would powerfully tend to allay that fear or distrust in the permanent value of this metal, which has of late had greater effect in producing the abnormally low prices ruling than anything else has had. Much has been said about the heavy stocks on hand, while, at the same time, a little over one million sterling would clear these all off, and shut up all the workshops in the country. Manufacturers have laid themselves open to be so dealt with at any moment by their absurd notion of keeping their stores bare of tin, while the prices have been so low as it is not likely they will ever see again. I am not able, at the present moment at least, to give you a complete list of all the uses to which tin is at present being applied; but I may enumerate a few, and then turn to a new use for it, which according to my view will require a much greater quantity than all the present consumption. Tin is used in very large quantities in the metal bearings of all our locomotives, and in what are called brass bearings in almost all machinery on land and at sea that requires great strength to meet heavy strains or rapid motion. When we look about on the thousands of miles of railways constantly at work and the vast extensions of these every day becoming more and more imperatively necessary, knowing that they are all wearing out fittings into which tin enters as an alloy in no mean proportions, we can readily conceive that there is likely to be no falling off in the consumption here. It would be very interesting to see a good account of the quantity of tin which every year goes into trinkets, toys, and ornaments, mock jewellery, &c. Something has been said of late about people wearing tin ornaments, in order to create an artificial demand for this metal by so doing. There can never be much got out of this. Few people are patriotic enough to decorate themselves with tin brooches and rings who can pay for gold, or even silver. At the same time, that they do wear a good deal of tin without knowing it in the cheap jewellery so much worn there is no doubt—and as the vanity of the human race does not seem to become less, or likely to become less in time on, the demand of tin for this purpose is not likely to fall off.

Some time ago there was some talk of tin-foil about being used instead of paper for the decoration of rooms. This would be a very sensible thing to do, as tin would be much more conducive to health than paper, and as half-a-pound in weight of tin would furnish sufficient tin-foil for covering a square yard the cost of it would be no material object.

But tin in sheets or tin-foil may advantageously be used in roofing, and as a little short of 3 ozs. would cover a foot, or say 18 lbs. of tin per square of 100 ft., the cost will be only about half that of slates to furnish a very superior roof. When people talk of tin not being adapted to resist the action of our climate when exposed on the roofs of houses they are speaking of tin-plates only, for pure tin in sheets would withstand any atmospheric influences we are ever likely to experience. This, too, will enable us to introduce a new feature of ornamentation into our architecture, by adopting the graceful curves sometimes seen in the ornamental roofs of eastern cities. Then, instead of dirty tiles or slates, which on every gale of wind persist in being blown off about our heads, we shall have roofs shining like silver in the sun, and once put on are on forever. In order to carry out this the roof timbers should be covered by boarding, in the same way as is now done in most public buildings, on the top of which, instead of sheets, the tin-sheet should be put on by a careful workman, and there it remains against rains, storms, or anything else. In cities and towns where people have any objection to broken heads from falling slates and constant repairs of roofs, in public parks, and in private pleasure grounds, where ornamentation is an object, and in all places where cheapness and durability are desirable, these roofs are destined, I believe, at no distant day to be universally adopted. W. TREGAY.

Redruth, Nov. 20.

SILVER ORE AND SILVER.

SIR,—Amongst the metals that are extensively obtained in nearly all parts of the world silver holds a high place, and is found in various forms in connection with other minerals. It is largely met with in gold workings along with that metal. Thus Ashantee gives—gold 90·095, silver 9·940, with a trace of copper; whilst some of the yellow metal found in Sutherlandshire produced gold 79·22, and silver 20·78; whilst some found at Wanlockhead, in Dumfriesshire, gave gold 86·60, silver 12·39, and iron 0·35. In France there is a native metal giving 71·69 of silver, and 26·15 of antimony; whilst in Utah, California, and South America the silver is raised as an ordinary ore and smelted. As to the formation of the precious metals, it has with some reasonable grounds been suggested that they have been deposited from alkaline solutions by the agency of metallic sulphides, such as iron pyrites. The formation of gold nuggets in particular may, therefore, be still going on in many drifts. This is the opinion of Mr. Skey, who also comes to the same conclusion that native alloys of gold and silver have been deposited from alkaline solutions in all probability by the agency of iron pyrites. But silver both at home and abroad is found largely deposited along with lead ore. In England and Wales it has always been met with in quantities, more or less, in the lead ores. In some localities the deposits are most valuable, whilst in others they are not so; but much may depend upon the mode of separating the metals so as to secure the whole of the silver, and at the present time this appears to be of more than ordinary importance owing to the low price of lead. Owners of mines should, therefore, pay every attention to the extracting of the metal which has the greatest value. If from 20 to 40 ozs. of silver can be obtained from a ton of ore that makes the latter really profitable, whilst if the yield is only 2 or 3 ozs. per ton then it is not so. But it is a singular fact that at the lead mines in England, of late years, there has been a marked falling off in the production of silver as compared with the yield of lead ore, whilst it is scarcely reasonable to assume that the metal has actually deteriorated in richness.

May it not, therefore, be that less attention has been devoted to the separation of metals than heretofore? In the Isle of Man, where the ore is richest in silver of any in the United Kingdom, the production of the latter has been quite uniform during the last ten or twelve years. But such has not been the case in Cornwall, Devon, Durham, Northumberland, and other English counties, where the decrease has been of a marked character. In some of the counties of North Wales there has been a slight increase in the quantity of silver, and in one or two others just the reverse. The mines in Ireland during the last two or three years have not been so prolific as they formerly were, although in that country the ore has been highly extolled for its richness. Scotland does not appear to have deteriorated, although the average is comparatively trifling of silver found along with the lead. Last year, it appears Derbyshire was not credited with any silver whatever, whilst a few years previously the returns gave it 6 ozs. to the ton of ore. Going back a few years we find that in 1866 the quantity of lead ore raised in the United Kingdom was 91,067 tons, which yielded 636,188 ozs. of silver; but in 1877 the ore raised was 80,850 tons, with 497,375 ozs. of silver. Taking the two periods the following figures will show the quantity of silver produced in each county, &c, as well as the number of ounces for every ton of ore raised:—

	1866. Total ounces.	Ounces per ton of ore.	1877. Total ounces.	Ounces per ton of ore.
Cornwall	195,218	29	23,035	11
Devonshire	13,017	18	4,948	14
Somersetshire	1,438	1	1,555	3
Shropshire	—	—	5,874	1
Yorkshire	2,393	—	7,472	2
Cumberland	27,867	5	14,091	5
Westmoreland	12,108	6	16,291	9
Durham, &c.	72,300	4	75,686	3
Cardiganshire	61,435	8	47,284	8
Carmarthen	3,218	4	2,064	3
Montgomeryshire	11,448	4	60,182	7
Denbighshire	25,267	4	12,900	4
Flintshire	35,050	7	17,689	6
Carnarvonshire	552	2	4,692	4
Isle of Man	147,516	43	186,019	42
Ireland	15,039	8	6,205	4
Scotland	8,704	4	11,306	4

Looking at Cornwall, to start with, it will be seen that not only was there a marked decline in the total production of silver, but in the percentage per ton of ore, whilst the adjoining county also shows a falling off in the percentage but a considerable increase in the output. The opening out of the Van Mine in Montgomeryshire has made all the difference to that county, for that mine last year yielded 22,645 ozs. of silver. In the Isle of Man the output has been large and the percentage, high as it is, has been well maintained.

Of late it may be stated that our imports of silver have been very heavy, the value having increased from 10,123,955*l.* in 1875 to 13,580,813*l.* in 1876, and in 1877 to 21,710,608*l.* In the last-named year we imported the immense quantity from Germany that was valued at 13,747,558*l.*, whilst in 1875 the imports were only to the extent of 1,152,523*l.* Our exports of silver in 1875 amounted to 8,979,746*l.*, in 1876 to 12,948,334*l.*, and in 1877 to 19,436,733*l.*

A COMMERCIAL.

MINING COMPANIES, AND THEIR MANAGEMENT.

SIR,—No doubt these are dull times, and lead mining companies, as well as all others, require to economise to make the most of a bad job; but there can be no use in bolstering up a company if it will not stand on its own bottom.

Now, I take it that a company who are only lessees of a mine, whether it be gold or lead or both, should be prepared every year to lay by such a sum as with the value to be realised for the plant may enable them to divide among the shareholders the money which they hold in trust for working the mine at the end of the lease.

Applying this rule to a mine which I have before me, the capital whereof is over 100,000*l.*, and whose lease has 10 or 15 years to run, I find the whole available produce, if sold, would not realise 10,000*l.* The plant would be dear at 5000*l.*, and yet here is a capital of 100,000*l.* I believe I am correct in saying that out of this 100,000*l.* the company have not spent 15,000*l.* on works since it came into their hands. I should like to know what has been done with the other 85,000*l.* I shall be told that the 85,000*l.* was spent first—a portion of it in buying the mine from the holders, and the remainder to the parties who sold the concern, which they bought from the company, to the present limited company, who, to use a vulgar phrase, "hold the baby." If I am correct, then, in my estimate the first holders have got their profits for the length of the lease, the second holders have got their profits for the lease, and the present holders must work the mine to the end of the lease for nothing, in order to raise the money to pay them.

Again, if I am correct that at the end of the lease the whole plant will not bring more than 5000*l.*, instead of dividing any profits they should lay by, supposing the lease to run 10 years, nearly 10,000*l.* a year, or 3*l.* 10s. per ton of lead, till the end of the lease, in order to pay up the capital, instead of deluding the shareholders that they will get a profit, which according to this is impossible.

It is pitiful hearing directors—who may be some of those who have sold the mine—prating about high lordships. It would be more to the point if they would disgorge their share of the plunder.

Applying these principles (say) to the Leadhills Mines, which were reported on in last week's Journal, it might be well if the shareholders had been made aware of the following data, along with the information as to Captain Waters' gold-washing cradles, got up, I have no doubt, most economically:—

The duration of the leases.

The value of the plant which the landlord will allow them to remove at the end of the lease.

The money paid to the former proprietors, and to whom.

The money paid by the present company. AN ENGINEER.

THE GLASGOW BANK FAILURE.

SIR,—The cloud that is hanging over the commerce of this country never, perhaps, looked blacker than now; ruin and disaster are impending in many a home, and no one knows on whom the next thunder bolt may fall. Verily these are troublous times. In business there is no confidence; distrust reigns universal; money is dear; and those who have capital button up their pockets and wait to see the outcome of the disturbance, holding off until the consequences of the present difficulties can be more accurately gauged. Credit being limited, and as a rule commerce unprofitable, engagements as they fall due must cause further failures; a long time will, therefore, elapse before a healthy state of affairs can be looked for. The most erroneous ideas prevail south of the Tweed as to the causes of the failure of the City of Glasgow Bank. It is a fallacy to speak of it as an instance of the viscissitudes of banking, and to say that a course of loans and discounting in the way of business has brought the failure about. It can only be considered a gigantic crime in the fullest sense of the term; a fraud committed by men abandoned to reckless speculation. For years past trade has been paralysed by these speculators, who by the extent of their operations drove honest firms out of competition, or lost them their hundreds of thousands. Take Nicol Fleming (who now "prefers Spain to Duke-street jail") as an instance. Years since he embarked in such hazardous undertakings that his agents closed the joint account, trembling at the risks he hazarded. Since then he has plunged headlong into such schemes, and ran riot with the money deposited by the too confiding customers at 133 branches.

One of your correspondents draws from all this the inference that unlimited liability companies are not suitable for banks, or in other words, that joint-stock concerns are dangerous. This appears so unsound a deduction that it is scarcely worth the combating. The principle is that a certain number of capitalists band themselves together for purposes of trade with a view to profit. To achieve this, however, they must undertake certain risks, and nothing would be more mistaken than to allow the shareholders to shield themselves behind the Limited Liability Acts. The depositors require some security, and in Scotland they find this in the property of the members of the copartnery. That these latter appointed dishonest officials is no excuse; they were bound to exercise supervision over their own affairs, and we think the confidence exhibited in Scotch banks during this time (unparalleled as it is) proves the high esteem in which the system is deservedly held. It is true that some of this feeling of safety on the part of depositors is owing to the fact that the Western Bank paid its creditors in full; the Glasgow Bank will turn out very differently. Looking at the fact that the 1200 odd shareholders have to make good a deficiency of over 5,000,000*l.* to begin, to which 2,000,000*l.* may safely be added for interest, legal charges, &c., and that the first call of 500*l.* per share will not raise

much above 2,500,000*l.*, we cannot see that more than 12*s.* 6*d.* in 1*l.* can at all be looked for.

The sooner depositors look this in the face the sharper will be the recovery in trade. False hopes may inflate business for a time, but no reaction can possibly take place until those who are involved in the failure realise their exact position. Shareholders have to face ruin, depositors heavy loss. Something may be done for both by the formation of gigantic companies for taking over the New Zealand properties and the Madras gold fields, and if the blow can be lightened many a willing hand will be stretched forth to help. The reckless trading of the past six years has culminated in this disaster by which in Scotland 153 failures for over 25,000,000*l.* in the aggregate have been announced. Surely this is the sharp purge; rotten limbs have been lopped off to give vitality to the languishing trunk.

How will all this affect Cornwall? Metals are all very much depreciated. Silver, demonetised in Germany, has glutted the market, and an enormous production in America has augmented the plethora, If, added to this, our insane Government should introduce gold circulation into India at least silver miners will not thank them. It is to be hoped, however, that the Affghan affair will take away their desire for the novelty of harassing another department in commerce. Copper cannot long remain depressed, and already steps are being taken which must soon place producers of this metal on a different footing. The tin market is for the nonce under good control, and sellers should hold off for better prices. We hope to see black tin selling at 50*l.* before the new year—a turn that Cornish mining sadly needs. Smelters and miners will hail the advent of "better times" with satisfaction and relief. To capitalists the iron market presents a safe field for operations. Cleveland pig is now at 37*s.*, or lower, and money may be safely invested in this direction, as iron cannot be produced at this rate, and prices must, therefore, rise, as the output diminishes. When the manufacture of steel becomes more thoroughly developed a great future will open up to Cornwall, and prosperity such as the most sanguine dare not foreshadow will reign in the county. Unless we very much mistake, the Cornwall Minerals Railway has opened out and intersected a second Cleveland.—*Nov.* 19. ——— G. BINGLEY LUKE.

THE PRICE OF COPPER ORES AT SWANSEA.

SIR,—Will some reader kindly explain in the Journal how it is that our English and most of the foreign copper mines are now selling their ores at 9*s.* and 9*s.* 6*d.* the unit, whilst the Cape Copper directors manage to get 12*s.* 2*d.* for the same weight of copper. A difference of 2*s.* 6*d.* to 3*s.* the unit represents no less than 12*l.* 10*s.* and 15*l.* per ton of copper.—*London, Nov.* 21. W. B.

PROSPECTS OF CORNISH MINING.

SIR,—Since my last on this subject the anticipations therein contained are more than verified, the rise in the price of tin metal being 12*l.* per ton, equal to 6*l.* per ton on black tin, or tin ore as sold to the smelters, thus taking many from the category of non-dividend into the list of dividend-paying mines, besides enhancing the value of the property—in cases varying from 50 to 100 per cent., as, for instance, Carn Brea has had a jump of about 10,000*l.*; South Frances. 12,000*l.*; Dolcoath, 20,000*l.*—and going considerably higher, while there are others, although a little more tardy, whose prospective value warrants a much greater rise than those named, and I venture to assert that within a short time a rise will take place in the value of some other mines as may revive the brilliant era of Cornish mining of years gone by, when the Tresavean shares rose in a short space of time from a nominal price to 2000*l.* each (per 98th), such price being warranted by the amount of profits afterwards divided among the proprietors, 60,000*l.* being divided the first year of its success. In its immediate neighbourhood a mine is now being wrought, with analogy pointing to like results. Copper mines should be sought after by those desirous of investing to advantage. I venture to predict that in a few months such as Devon Great Consols, West Tolgus, and other established mines will command a much higher price. That Cornish mining has passed its worst may be inferred from the fact of the demand for metals now exceeding the supply, thus giving the investor the oppartunity of reaping a rich and quick reward for a small outlay. CHARLES BAWDEN.

St. Day, Scorrier, Nov. 20. ———

NORTH LAXEY MINING COMPANY.

SIR,—Though a constant reader of this valuable Journal, no mention now I find is ever made of how matters are progressing with regard to the contemplated reconstruction of North Laxey Mining Company; nor, indeed, do I ever find any report now issued from the mine itself, per Mr. Rowe, as in former days. Possibly this gentleman may kindly enlighten me and my co-shareholders as to this last point—I mean as to the present prospects of the mine, and of what work is now being prosecuted at the mine, and with what result, no report having appeared in the *Mining Journal* for some weeks. Such favour I, with others, claim as a long existing—

——— HOLDER OF 50 SHARES.

KILLIFRETH MINING COMPANY.

SIR,—In a late impression, I notice your Scotch Correspondent (who seems a master of the subject) in his weekly report says, inter alia, "should tin rise a good deal, Killifreth also is a mine that will prove a prize." Your Correspondent is undoubtedly correct; but what strikes me as singular is that at such a distance from the mining field the merits of Killifreth should be known and appreciated, while nearer home they are almost disregarded. Our northern friends have proved themselves particularly sagacious in matters of this kind. A few years ago Tokenbury was being hawked in the London market without success; it was purchased in Glasgow, and, under the name of Glasgow Caradon, soon became a successful paying property. Tharsis, also, could not find a purchaser in London, but at Glasgow a company was formed for purchasing it, and in less than two years the 10*l.* shares became worth 40*l.* per share, to say nothing of dividends; and most mining men are familiar with the fact that when East Caradons were unsaleable in London at 5*s.* per share they were bought eagerly in Glasgow. They were soon selling at 50*l.* per share. Either by acute observation or a perfect system of obtaining information, Scottish speculators would seem to have the advantage to an extent which does not obtain amongst us nearer home; and in selecting Killifreth by your Correspondent another instance is given of superior discrimination.

York Buildings, Nov. 21. ——— CIVIL ENGINEER.

PANT-Y-MWYN MINE.

SIR,—In reply to the letter signed "Aberdaunant," which appeared in the Journal of last week, I beg to say that it is a complete fabrication, which anyone may know for himself if he will take the trouble to search the Journal of the date referred to in that letter. Instead of being discharged, it was only by persistence that the company would let me go—the result of which I will not now say.

I have put my solicitor in communication with the parties who are responsible for its publication, who will call on them for suitable and just reparation.—*Llanwrst, Nov.* 20. JOHN ROBERTS.

PANT-Y-MWYN MINE.

SIR,—My attention having been called to Messrs. Watson's Circular in reference to a private report I made on this property, I beg to state that, with regard to a report which has probably emanated from my brother (residing near Wrexham), there is no discrepancy that I can discover. His estimate will, no doubt, be for reopening the old range of mines eastward with new machinery and plant, but this is a different matter to developing the present discovery in new ground, and simply erecting a powerful engine on a shaft now sunk into ore ground, giving immediate returns, whilst deeper explorations are carried on.

With regard to the dressing arrangements, I was requested to say what quantity of ore could be dressed with those appliances now in use, and I do not think I should find much difficulty in getting through 200 tons per month with such appliances of such "boose" as we generally find in our limestone veins in this locality. If any gentlemen interested in the question will visit Rhyd Alyn (the adjoining mine) they will find the process very simple indeed. They have had but little difficulty, however, in dressing 40 tons a month with appliances of a comparatively meagre description, and I think they reckon on their ability to dress 200 tons a month if required, with little addition except extra hands. WILLIAM FRANCIS.

Northop, Flintshire, Nov. 20. ———

OLD TREBURGETT MINE.

SIR,—In reply to the letter of Mr. Hancock, published in the Journal of Nov. 9, I again make the assertion that the last parcel of silver-lead ore sold by the halviner from the above mine fetched 22*l.* per ton, since which he has disposed of a small batch of dredge stuff that he had no means of separating, having no crushing power on the mine, for 11*l.* some shillings per ton; and in a personal interview I had with the halviner last week he states that if the parcel of ore he is now preparing for the market, and which will be sold in the course of a week or two, does not bring the sum of 22*l.* per ton he is quite prepared to forfeit the entire lot. Truly facts are stubborn things. Mr. Hancock in his letter also kindly promises if I again write anonymously he will publish a report of the above mine for the benefit of capitalists. This certainly is a step in the right direction, and as a means of bringing to light such an act of disinterestedness in the shape of a report, I cannot but refrain from signing my name to this letter, and "as one good turn deserves another," I may then be induced to favour your readers with the history of the Old Treburgett Mine, with remarks by the way. As to the men offering to work the mine on their own responsibility, which Mr. Hancock says is a deliberate falsehood, I would refer your readers to the letters that appeared in the Journal from the miners of Old Treburgett in the months of November and December, 1877, and they can then judge for themselves at whose door the falsehood lies.—*St. Teath, Nov.* 19. LOOK-OUT.

LEAD MINES—LEAD SMELTERS.

SIR,—No wonder the home leading lead mining companies are so bitterly and loudly complaining of the most unjust prices now being given by the lead smelters for lead ores. It is still more unaccountable that the lead mining companies do not combine and smelt their own ores, and by so doing reap a splendid profit. As rather a large shareholder in many of the leading lead mines, I protest—as I hope other shareholders will do—against our lead ores being disposed of at present, in fact I may truly say giving-away, prices. Why do not the directors of lead mines hold a meeting, and see what can be done by a combined action? REFORM.

Nov. 20.

[For remainder of Original Correspondence, see to-day's Journal.]

Meetings of Public Companies.

ENGLISH-AUSTRALIAN GOLD MINING COMPANY.

A general meeting of shareholders was held at the offices of the company, Austinfriars, on Wednesday,

Mr. J. W. WILLIAMSON in the chair.

Mr. MURCHISON (the London manager) read the notice convening the meeting. The directors' report was read, as follows:—

Nov. 20.—1. Your directors have now to report that in accordance with the recommendations contained in Capt. Lewis's report of Feb. 16, 1877, the following operations have been carried out. The engine-shaft has been sunk to the required depth for a 420 ft. level, and a cross-cut put out for 25 ft. from the shaft. At this distance the cross-course was met, on which the level was driven until the intersection of the eastern lode at 152 ft. from the shaft. For a short time the drivage was in quartz containing visible gold, but a strong bar of country having been met with, and the available funds being low, further progress in this level was suspended. The total distance driven from the shaft was 317 ft.; a rise on the lode was then commenced, and at the date of last advices had been put up 71 ft., having passed through a strong body of quartz, very poor stone; but the work done upon it as yet is no test of its value. The prospecting shaft was sunk to the 320 ft. level, and the mine is now thoroughly ventilated to that depth. The level has been extended 136 ft. from the shaft, and two rises put up for working the stope, and to prove the stone further south. The second of these is only 70 feet from the New Era (Ferrons) Company's northern boundary, and contains a large body of good-looking stone, which can be easily worked, but which does not yield the gold anticipated. Mr. Elsbury, the New Era Company's manager, stated on June 7 last that the 200 ft. level (which is 50 ft. above our 320 ft. level) was about 60 ft. from our boundary, and was of opinion that in sinking a winze from our 320 to 420 ft. level stone would be met with. The stone found in the former level is, he says, very similar to stone worked by us (New Era Company) on the same wall. The New Era Company have cut a wall carrying stone with payable gold, at their 380 ft. level (equal to a depth of 450 ft. in the English-Australian Mine), and the last information received respecting them is that they are still paying well, and are now having 10 other heads of stamps erected, as they have more payable quartz than they can crush with their present batteries—20 head.—2. The 420 ft. level which, as before stated, was suspended in a hard bar of country rock, is now 370 ft., and the rise and drift in the 320 ft. level is 70 ft. from the boundary. This rise is set to a party of tributers, who are to keep four men driving south. To push the 420 ft. level to the New Era Company's boundary will require, Capt. Raisbeck estimates, seven months' working, and a monthly expenditure, including engine and other charges, of 240*l.*—3. The balance-sheet, which has been circulated among the shareholders, shows the belance of assets to Oct. 31, including colonial balance to August 31, to be 541*l.*, and as at the date of last advices from the colony, received here on the 18th inst., the payable stone dipping from the New Era Company to our ground had not then been reached (though not likely to be far off), it will be necessary for the shareholders to consider what steps should be taken to provide the further funds which will probably be required. At this meeting the directors only desire an expression of opinion as to the course to be adopted, as special meetings will have to be held to give effect to any resolution passed to-day.—4. Your directors regret that, owing to the time occupied by correspondence with the Australian solicitors, it has been hitherto impossible to complete and register the various documents which, for the protection of the shareholders, must be filed before the issue of the fully-paid and bonus shares. The death of Mr. Wingrove, the liquidator of the Anglo-Australian Company, will contribute to the delay in the issue of these shares, but at the earliest practicable date they will be distributed among the shareholders.—5. Your directors regret the retirement of Mr. Wingrove, who was unavoidably compelled to resign his seat at the board at the beginning of the present year, and still more regret his recent death.—6. The accounts have been audited by Messrs. Brandt, Stansfield, and Company, whom the directors appointed auditors, and who, being eligible, offer themselves for re-election.

The accounts, having been circulated, were taken as read. It was then proposed by the CHAIRMAN, seconded by Col. SHARP, that the report and accounts be received and adopted, and printed and circulated among the shareholders.

Mr. MURCHISON read a letter from Mr. Lamb, regretting his absence from the meeting through being out of England for a few weeks. He also urged strongly that funds should be provided to enable the company to reach the payable body of stone dipping from the Ferron's Company's mine to this company's ground, adding that there was little doubt they were near it. Mr. Lamb also stated that the amount to be raised should not be less than 2000*l.*, towards which he was willing to subscribe 100*l.*

A long discussion took place as to the position and prospects of the mine, and the best course to adopt for raising a further moderate amount of capital. It appeared from the statements of the Chairman and others that the workings of the adjoining mine of the New Era Company (late Ferron's) are very close to this company's boundary on the run of the same gold-bearing stone, and that they are making considerable profits, having already paid dividends in addition to paying for the erection of new machinery out of the returns.

Mr. MURCHISON stated that last year the English-Australian Company's mine was examined by Mr. John Lewis, one of the leading mining engineers in Victoria, who had so favourable an opinion of it that he offered to take the mine and work it on tribute, engaging to spend a considerable sum on the property in order to work it in a systematic manner, and with the most efficient machinery. Since then the English-Australian Company has spent nearly 3000*l.*, and it is estimated that only 2000*l.* more will be ample to thoroughly open the mine in a proper manner, and would most likely bring it into a paying state. He reminded the shareholders that whilst the mining interests generally were suffering at present from the greatly depressed prices of copper, lead, and tin, this was a gold mine, and there was little or no chance of the precious metal being depreciated in value, the standard remaining the same under all circumstances. This company was receiving at present 77*s.* to 80*s.* per ounce for the gold sold. It appeared from several remarks that had been made that the plan which would meet with most favour from the shareholders for raising additional capital would be by the issue of shares carrying some advantage, in the shape of a preference from profits or otherwise. He asked how it would answer to issue 5000 fully paid up shares of 10*s.* each, payable by instalments, to carry the same dividend per share as the present 1*l.* shares. As there were already 20,000 shares of 1*l.* each, this would make 25,000 shares.

The CHAIRMAN said that from what he had heard he did not think debentures were likely to be taken up.

Mr. JOHN PROCTER stated that he should prefer shares, but there must be a good inducement for taking them up, and if so he would probably take his proportion.

Mr. DAUKES said that from what he and the other directors would subscribe in addition to what the shareholders would take up he believed the whole sum would soon be completed.

Dr. JACKSON remarked that he thought the best plan would be to give a preference percentage on the new shares, as the whole 10*s.* might not be called up.

Mr. MURCHISON replied that in the first place he thought it might be taken for granted that the whole of the 10*s.* would be called up, but at any rate the subscribers would have to make themselves liable for it, and would require the same inducements to do that as if they were certain of being called upon to pay the whole amount. If, however, the shareholders preferred it, and it was sufficient to get the shares taken, it might be arranged that these new shares should be entitled to a preference dividend of one-third of the profits, or (say) 33 per cent., out of the profits of each year.

It was ultimately resolved that the report and accounts be passed and adopted, and that it was desirable to prosecute the further working of the mine, the directors being requested to prepare a scheme for raising the money, and to call the necessary meetings for sanctioning the same. Messrs. Brandt, Stansfield, and Co. having been re elected auditors for the ensuing year, the proceedings were brought to a close with the usual compliment to the Chairman.

WEST CRAVEN MOOR LEAD COMPANY.

The annual general meeting of shareholders was held at the mine on Nov. 7, Mr. R. H. SILVERSIDES in the chair.

Mr. GRANVILLE SHARP (managing director and secretary) read the notice convening the meeting, and the report of Capt. David Williams, the resident agent, was submitted. After referring to the various points of operation, the report states that they have raised and dressed during the year 125 tons of ore, and have other 10 to 12 tons in course of dressing. Had the new floors been completed they would have nearly doubled the returns, and with a better price for lead would, he has no doubt, have realised a profit upon last year's working. By extending the 42 east and west upon the Blackhill vein, to get under the ore ground going down in the sole of the adit level, and driving Blackhill level east under new west shaft and new east shaft, which will give 18 fms. of additional backs high and dry for stoping upon the valuable runs of ore ground left standing in those shafts, he feels confident that West Craven Moor will prove a successful and profitable investment.

The CHAIRMAN said that since they began to work there has been 189 tons of ore raised and dressed, producing 121 tons of pig-lead, and there is now 35 tons of ore at the smelt-mill, besides 10 or 12 tons on surface. In 1876 they sold 16 tons of pig lead, in 1877 this was increased to 36 tons, and 61 tons had been sold in 1878, exclusive of that which is now at the smelt-mill and on surface. Some portion (not much) of the produce for 1878 was raised before the beginning of the year, and the increase in production (the ore now at the mill will give 20 tons of pig-lead, deducting the royalty) has been more than double the quantity for 1877, and five times the quantity for the year 1876, with every prospect of still greater increase, so that were it not for the very great reduction in the value of lead (their first parcel having been sold for 21*l.* a ton, the last for 15*l.* only) the outlook would be cheering and encouraging indeed; and they will confidently hope that this long-continued and very serious depression, not alone in metals but in everything else, may soon have an end.

The Managing Director's report was then read, and stated that all the stopes in the eastern part of the mine are stopped for the present, in consequence of the low price of lead, but although the price of lead is so low as to prevent a great deal of it being returned at a profit with their present appliances for dressing, it could be profitably returned were their new dressing-floors completed, and to this matter he would particularly draw attention, the low prices realised during the last twelve months for their lead had made a difference of some 400*l.*, more than sufficient to have completed one of the best and most modern ore dressing plants in the country, plans and sections of which have been prepared by their agent, and specifications for the completion of same have been received, requiring now only 300*l.* more laid out in this department to enable them to return their mineral on a much more extensive scale, and at considerable less cost.

The reports were unanimously adopted. Mr. E. Hilton was re elected director, and Mr. E. Green was re-elected auditor, the proceedings terminating with the usual complimentary vote of thanks to the Chairman.

MEDLYN MOOR MINING COMPANY.

A meeting of the shareholders in this mine was held on Thursday Nov. 14, at the London office,—Mr. HILTON in the chair.

The notice convening the meeting was read, also the minutes of the previous meeting, which were confirmed. The statement of accounts for 28 weeks was presented, showing a loss of 1567*l.* 5*s.* 9*d.* The same after being investigated was allowed and passed.

Mr. SHARP (the secretary) said that the meeting would have been held two months earlier, but the manager was desirous to prove the north lode before this meeting. It would, no doubt, be disappointing to many the very small credit for tin sold during this period, especially so considering the expenditure, but this would be satisfactorily explained.

Capt. PRISK: You must consider the extra costs we have been to in sinking the shaft on the north lode. This must be taken into consideration, and I think, gentlemen, when you have heard my report read you will be thoroughly satisfied that the costs incurred have not only been judicious, but that the results will soon prove advantageous to all interested, for I am able to tell you that we have got a good lode—one to all appearances which will soon produce tin in paying quantities.

The report was read as follows, which, with the assistance of a plan and section of the working on the lodes was fully and satisfactorily explained:—

Nov. 12.—Since the general meeting of shareholders, held on April 17, our principal points of operation have been the deepening the mine below the 27, on No. 1 south lode, and sinking a new shaft from surface for the developing a north lode, for which purpose we have had to do the following preparatory work:—No. 1 South Lode: The flat-rod shaft has been cut down, and enlarged from the 8 to the 17, and a communication effected with the 27 by rising and sinking; we have also sunk this shaft below the 27 about 6 fathoms, for the purpose of testing the lode in depth, finding it did not improve in sinking we drove about 4 fms. east, where we considered a shoot of tin seen in the level above might be met with, but so far it has not proved to be as good as we had reason to expect. This was considered by great mining authorities to be one of the main lodes of the district, and in the upper levels gave signs of being highly productive, and even the 27, when the shoot referred to above was driven through, was worth for a short distance 25*l.* per fathom; ground is hard, costing 9*l.* per fathom for driving.—New North Lode: A new shaft has been sunk from surface to the 20; here the lode was met by a short cross-cut, which is being wrought on with every possible dispatch. The 20 has been driven east of shaft about 10 fms. through a good paying lode, especially for tribute working, which is the most profitable mode for a lode of this character, as the ore stuff is very rich, and free from all impurities; lode in this end worth 9*l.* per fathom; driven by six men, at 3*l.* per fathom. The 20 has been driven west of shaft about 11 fathoms, and with the exception of 3 or 4 fathoms has all been through paying ground; the lode in the present end is worth 10*l.* per fathom; driving by six men, at 3*l.* per fathom. In the stope in the back of the 20 fm. level east the lode is worth 5*l.* per fathom; working by four men, at 16*s.* per fathom. The lode in the stope in the back of the 20, west of shaft, is worth 6*l.* per fathom; working by four men, at 16*s.* per fathom. In order to work this part of the mine from the same pumping engine a line of flat-rods with pulleys and stands has been laid down a distance of 80 fathoms, bob stand of masonry built, bob fixed, also horse-whim and shears. For the underground department 40 fathoms of 11-in. pumpwork has been purchased, which is now in use and paid for.

We beg to inform you that the new north lode is embedded in a soft congenial stratum (decomposed granite), which makes it inexpensive for working; all our levels are being driven for 3*l.* per fathom, and in some instances we expect to do it for less. The very large amount of dead work which has been carried on in the last six months has increased the monthly cost, especially in timber, which was required principally for the timbering of the new shaft and the erection of the flat-rods; this, however, is complete, and the heavy outlay made is all charged in our accounts to day. Seeing the prospects so good on the new north lode we have concentrated all our forces here with a view of developing this part of the mine east and west as rapidly as possible, which will not only enable us to make good monthly returns but after the present month we hope to be in a position to meet cost. We recommend suspending operations on the south part of the mine for the present, which will effect a great saving in engine cost, which is our principal expense. The number of hands employed on the mine is—Tutwork, 20; smiths, 1 man and boy; spalling, 1 man and boy; engine men, 3; landing and filling, 2 men; at stamps, 1 man, 5 girls, and 5 boys: total, 40.—JOSEPH PRISK, CHARLES ROWE.

Mr. DON: Do you consider, Capt. Prisk, that the south lode should be abandoned altogether?——Captain PRISK: Decidedly not; we only advise suspending operations on the south lode for the present, it being poor; but as soon as we get into a paying position on the north lode, or with tin at a better price, I would recommend that the sinking of the shaft on the south lode be resumed.

A SHAREHOLDER: Then you think the falling off in the value of the south lode only temporary?——Capt. PRISK: Yes, I do; it is a very usual thing to find poor bars of ground in mining operations; and, judging from what we have seen and had in the 27, I feel satisfied that the chances are in favour of its being equally good in quality and more lasting in extent as depth is gained. Still, for the present, as advised in the report, suspend operations, and concentrate all our force on the north lode, which is a good one.

Mr. DON: The price per fathom which you value the north lode (9*l.* or 10*l.*) seems to indicate not a rich lode.

Capt. PRISK: The lode is not a large and poor one, but is small, and rich for tin, which, as a rule, are the most profitable; the tin being contracted in a small body of stuff, enables it to be returned at a small cost in every way.

Mr. SHARP: Is that tinstuff a fair sample of the lode?——Capt. PRISK: It is. The lode when I saw it, on Tuesday last, was quite equal to sample, and the leading part was much richer. That before you is a fair specimen.

Mr. SHARP: From the appearance of that stuff very little, if any, calcining is requisite.——Captain PRISK: You are quite right, but we must calcine the parcel now being prepared for sale on account it being mixed with the tinstuff from the south lode, which contains iron and mundic; but for this no calcining would be requisite, the stuff from the north lode being so pure. After the parcel now being got ready for sale we shall be clear of all iron and mundic on the floors, and shall then go on dressing at considerable less cost, from the fact that the stuff is easily dressed, and no burning will be necessary.

A SHAREHOLDER: I must say that the report and explanations given by Capt. Prisk of the north lods are very satisfactory.

Capt. PRISK: Well, gentlemen, I certainly think that we shall now be able to meet costs—I mean after this month. As we extend our drivage east and west we shall be able to employ additional hands on tribute, at a profit to the shareholders

Mr. SHARP said the prospects were certainly more cheering than at any previous

period of the mine's history, and from what he heard of the north lode from others beside our manager, and the calculations made as to its production, the quantity of tinstuff to be broken per month—that is when the levels are further extended, so as to employ more tributers—and the very small cost at which the same can be returned, I think our manager's concluding remark—"at a profit to the shareholders"—is well grounded, and I think, gentlemen, that we have no fear of anticipating a repetition of such a heavy debit against us. If I thought there was I should be disposed to not only suspend operations on the south lode, but the operations altogether. To meet the balance against us it is requisite that a call of 6s. per share be made, but that is a matter for you, gentlemen, to decide.

After some discussion a call of 6s. per share was proposed by the CHAIRMAN, and seconded by Mr. DON, and carried unanimously, payable in three equal instalments of 2s. each.

A vote of thanks to the Chairman for the courteous manner in which he presided on this as on very many previous occasions was unanimously recorded, and terminated the business of the meeting.

SAINT PATRICK LEAD MINING COMPANY.

A meeting of shareholders was held at the offices of the company, Coleman-street, on Wednesday,

Mr. ALFRED THOMAS in the chair,

Mr. R. CUMMING (the secretary) read the notice of meeting and the directors' report.

In meeting the shareholders at this period of the year the directors call attention to the fact that the ordinary annual meeting is not due until March, 1879, but that circumstances have arisen which render the present meeting necessary. It will be remembered that at the meeting held in March of this year the company was in debt to the amount of 360*l.* in cash, and it was arranged to issue 2000 shares of the reserve capital to meet this and provide for the working of the mine. Of this proposed issue only 1000 shares (or thereabouts) were then taken up by the shareholders, and it is with a view of obtaining a better response from the shareholders that this meeting has been called, and the position of the company laid before them. The statement of accounts has been prepared and circulated. The directors have received from time to time most positive assurances from the local manager that his opinions with regard to the future productiveness of this mine have undergone no change, but that he is still as confident as ever of the most favourable results. Notwithstanding this, and realising the fact that nothing has been discovered that would enable them to give the shareholders an idea when they might expect a dividend, the directors have not failed to look with great care and seriousness into the state of the mine; and acting upon what they consider to be the true interests of the shareholders, they have at some trouble, but they are pleased to state without any great expense, secured additional grants of lands adjoining the present company's property, whereby the levels now existing can be driven into it at the most favourable depth, and a thorough trial be carried out. These additions are shown on the plans. The future prospects of the company depend mostly upon these explorations, and the directors trust that the shareholders will now come forward and assist in their respective proportions to carry out the further objects of the company by taking up the remaining 2000 shares of reserve capital, which it is proposed shall be offered them on the most favourable terms—15s. per share each for the 1*l.* fully paid shares. Proposals in accordance with the above will be submitted. The underground operations carried out since the last meeting and those for the future will be more readily understood and realised by reference to the agents report and the plans and sections.

In conclusion, the directors congratulate the shareholders of the company upon the acquisition of the adjoining properties, comprising three grants of very valuable mineral ground, and in combined extent equal to the original sett, which could not have been acquired unless the St. Patrick Company, by their great expenditure and outlay in bringing their levels to their present position, had not established their first claim and title to it, which has been recognised by the Duke of Westminster and the Rev. Mr. Richardson, the respective landowners.

Nov. 20.—In reviewing our operations for the last twelve months, I have pleasure in saying that the progress made has been satisfactory, and entirely unimpeded by any obstacle during the whole period. The mine being naturally drained, as already proved, for 135 yards deep, in the best-bearing eastern strata, and a further depth even being attainable, this circumstance can scarcely be too highly valued and appreciated. It will always show this property as exceptionally advantageous to other properties situated in the district, and effect an immense economy in the application of steam pumping machinery in the future development, as well as in the present outlay. The 120 yard cross-cut has been driven northward 83 yards in the carboniferous limestone, and the 60 yard cross-cut has been driven 40 yards in the chert formation. In the former we have had the advantage of the cross course which has shown throughout its strong and most congenial features, bearing compounds mixed at intervals with lead ore, and principally in one shoot of orey ground taking a direction dipping northward. I have little doubt this is in connection with a valuable vein to the north of the present end, which we must be fast approaching, and may intersect at any moment, and I have no doubt whatever that it will be the means of opening out one of the best properties in Flintshire. I may point out to your notice, in the same measures, the old Pant-y-Go Mine to the south, which yielded almost fabulous riches, as indicated by records now in existence, and also the Parry's Mine and Penyrhenblas to the north, both of which have proved exceedingly productive within a more recent period. This is entirely virgin ground, and the 60 yard cross-cut in the chert is also a very important driving for opening out new discoveries. It gives me much satisfaction to notice a great and most important addition lately made to this property by the acquisition of the Rev R. Richardson's land, which embraces the famous old St. George's Field workings, in the chert measures, one of the richest veins ever worked, and it is a notorious fact, well known, and much commented upon, that this vein has never up to the present time been found in the limestone below, although it has been very extensively and profitably developed in the adjoining property westward in those measures for a very considerable length. That it does exist in this ground is beyond doubt therefore, and, moreover, the cleavage in the country through which it has been worked is so defined as to prove a simultaneous rupture in both formations where the chert vein was found. It has most probably been shifted to the north, and I look to this as a certain promise of further great discoveries in your now extended sett. In addition to this, and what is of more immediate consequence as touching our present operations in the 120 yard cross cut, I have received information, which I think can be relied on, that the next main lode before us was many years ago discovered at the western boundary, containing some lead ore, and of great promise, being from 2 to 3 ft. wide, but from the great disadvantages in working it through several sumps, and the demise of the principal proprietor, nothing whatever was done on it. The line of its direction would bring it within a short distance of the present end of the 120 yard cross cut, and confirm me in the anticipation of great results from this quarter. In conclusion, I have the satisfaction of saying that, whilst there is no feature which has come under my notice during my experience in the workings causing me the least anxiety, or having the least influence in altering the sanguine views I have ever held of its value, I am, on the other hand, able to affirm that every new feature that has presented itself tends more and more to the conviction that there is in this property a certainty of my best hopes being shortly realised to the fullest extent.—WM. FRANCIS.

The CHAIRMAN, in referring to the statement of accounts, explained the course taken by the directors in recommending the issue of the remaining shares belonging to the company. A discussion took place upon this, and it was decided unanimously to adopt the recommendation of the directors. The directors since the last meeting having acquired additional grants to the company's property, a vote of thanks was passed to them for their successful exertions in this direction, and a vote of thanks was also passed to the Rev. R. Richardson and the agent of the Duke of Westminster in respect thereto. A further discussion took place upon the report of the agent and the future prospects of the mine, which were considered very satisfactory, and followed by the complimentary vote to the Chairman the proceedings terminated.

WHEAL PEEVOR MINING COMPANY.

A four-monthly meeting of adventurers was held at the mine, on Monday, Mr. T. PRYOR (the purser) presiding. There was a large number of shareholders present. As will be seen by the agents' report, the mine is in a very flourishing condition; and, provided the several points should prove so productive as anticipated, will more than pay costs, even with the present low price of tin. The financial statement showed a profit on the 16 weeks' working of 855*l.* 6s. 4d., making a total in favour of the mine of 1118*l.* 1s. 6d. A divivend of 5s. per share was declared. The agents (Capts. W. T. White and Joseph Pryor) reported:—

The lode in the 80 fm. level, driving west of Sir Frederick's engine-shaft, is the full size of the end, and worth 20*l.* per fathom. Since the last meeting two winzes have been communicated to this level from the 70, both of which have been sunk in very productive ground, and which is now lying in reserve until some future time for stoping. The lode in the 70, driving west of shaft, is worth 11*l.* per fm. The rise referred to in our report at the last meeting, in the back of this level, is now communicated to the 60, and the men put to rise in the back of the 48, to open up the ground at that point west of the cross course. Nos. 1 and 2 stopes, in the back of this level, are each worth 13*l.* per fathom. The lode in the 60, driving west, is worth 13*l.* per fathom, and the stope in the back of this level is worth 11*l.* per fm. The lode in the 48 fm. level, driving west, is worth 11*l.* per fathom. The lode in the rise in the back of this level is worth 10*l.* per fathom. The lode in the end, driving east to the main rise, in the 48 fm. level, is worth 10*l.* per fm. Two stopes in back of this level are worth each 14*l.* per fathom. The lode in the 36 fm. level, driving west, is worth 25*l.* per fathom. The lode in the rise in the back of the 36 fm. level, west of the cross course, is worth 10*l.* per fathom. The lode in the rise in the back of the 36 fm. level, east of the cross course, is worth 11*l.* per fathom. The stope in the back of this level is worth 12*l.* per fathom. The lode in the 36 fm. level, driving east of the main rise, is worth 9*l.* per fathom. The lode in the 26 fm. level, driving west of main rise, is worth 10*l.* per fathom. The lode in the main rise, in the back of the 26 fm. level (carried 12 ft. long), is worth 10*l.* per fathom. There are two cross cut driving south to intersect the south lode at other points—one at deep adit, and the other in the 36 fm. level. We have completed the cutting of a balance bob-pit in the 36, and the carpenter is now building the bob. The shaftmen at present are engaged in putting in tramroad, &c., in the 80 fm. level. We have 12 pitches working on tribute, varying from 5s. 6d. to 11s. in 1*l.* At the time of our last meeting we were busily engaged in erecting an additional 16 heads to our stamps, which we continued for some weeks after, and have completed all the masonry, put the fly-wheel together, and in its place. The price of tin fell so low that we thought it best to suspend this work for awhile until tin should advance again, when the work could be resumed, and the stamps put to work at a short notice. The mine, we are pleased to say, still looks well, and, although returning large quantities of tin, we are continually adding to our reserves.

The CHAIRMAN stated that the accounts were brought up as close as they could possibly bring them. The labour costs were charged up to October 26, and the merchants' bills to the end of October. On the credit side they would see that they had sold 160 tons of tin at an average of 32*l.* 15s. per ton, so that the average this time was about 30s. a ton less than was realised for the tin sold previous to the last meeting, which made a difference of about 250*l.* less to the adventurers. He also mentioned that the meetings were previously held on Thursdays, whereas this time it was held on a Tuesday, so that really they had not much more than 15½ weeks returns against 16 weeks costs. He thought that was a very satisfactory state of things, considering that their tin was sold at least two or three days before their usual time. He then proceeded to show the quantity of tin sold, and the average price per ton, and stated that for the four months ending February last they sold 144 tons, at an average price of 35*l.* 12s. 6d., the cost of returning being 28*l.* 2s. 6d.; during the four months ending June 148 tons of tin were sold at an average of 34*l.* 5s. a ton, which cost them to return 28*l.* a ton; for the four months ending October 160 tons were sold at an average of 32*l.* 15s. per ton, which cost the mine 27*l.* a ton to return, so that the actual profit to the mine was 5*l.* 10s. on every ton of tin sold. The report he (the Chairman) thought was a very satisfactory one. He had added up the aggregate value of all the points in the mine, which makes about 230*l.* per fathom, so that you see by that we are opening up a large extent of ground. (Hear, hear.) Although we have returned a large quantity of tin, it must not be thought for a moment that we have been tardy in our tutwork operations, because, as a matter of fact, our labour costs at the present meeting exceed by 350*l.* what they were at the last meeting. He believed the men in Wheal Peevor were as well paid as any in the county, the average wages being about 3*l.* 5s. per month each man.——Mr. COCK proposed, Mr. DAVEY seconded, and it was carried unanimously, that the accounts be received and adopted.

The CHAIRMAN suggested that they should pay the usual dividend of 5s. per share, and that the balance of 110*l.* be added to the balance in hand. He thought that would be satisfactory to the shareholders, and they ought to congratulate themselves on the success attained during the exceedingly low price of tin.——Mr. WOOLCOCK proposed, and Mr. JOHN HITCHENS seconded, that a dividend of 5s. per share be declared, which was unanimously agreed to.

Mr. MITCHELL said they were still opening up a large amount of ground, and the cross-cuts now being driven were likely to be attended with good results. The cross-cut at the deep adit level, and the other at the 36, were important points, and if they struck into tin in either of them it would lead to a vast extension of the tin ground. Figures proved that although the importation of Australian tin was slightly increasing the demand for it was very largely in excess of the Australian supply, and the consumption was growing at a very rapid rate. That being so, he believed they had reason to look forward to a decided rise in the future. They had reached the lowest point, and he believed any change must be for the better. (Applause).

Capt. WHITE (the manager) said he was pleased to meet with the adventurers under such favourable circumstances, although the price of tin was rather low. The mine was looking extremely well, and he did not see any falling off in any of the points of operation. They could go into a great many places in the mine and take away 20 tons of tinstuff in a very short time. (Applause.) He never saw anything equal to the south lode in that mine; in fact, it was the finest he had ever cast eyes upon. The cross-cut at the 36 was 60 fms from the point where they had the lode so productive. The one at the deep adit was 36 fms. above that again, and the one which they were now driving at (the 36) was at right angles with the engine-shaft, and if a good lode was cut there—and they hoped to cut it in seven or eight weeks—it would add very considerably to the value of the mine. (Hear, hear.) Their large returns induced some people to suppose that they were working out their reserve ground, but he could tell them that out of the 20 bargains which they had on tutwork only six stopes were taking away ground. (Applause.) All the others were developing the mine, and two-thirds of their tin was raised from ends, rises, and winzes. (Loud applause.) Without taking away a fraction of ground for the next two years, they had at this moment more than 2000 fms. laid open and ready to be taken away at any time. (Hear, hear.)

— *Western Daily Mercury.*

DOLCOATH MINING COMPANY.

A three-monthly meeting of adventurers was held at the mine on Monday, and was largely attended. The Rev. W. W. BUTLIN presided. The accounts showed a profit of 1059*l.* 7s. 4d. on the three months' working; balance from last account, 43*l.* 11s. 8d.: total balance in favour of mine, 1102*l.* 19s., which, after declaring a dividend of 5s. per share (1074*l.*), leaves a balance in hand of 28*l.* 19s.

The CHAIRMAN stated that at a committee meeting, held on Nov. 11, Capt. Thomas presented an agreement made with Messrs. Ullathorne and Co., of London, for driving the 352 with their Champion boring machine, which was thought to be satisfactory, and it was reported that they expected to get to work in about a month. The question of recommending some gentlemen to be appointed in the place of the late Sir F. M. Williams having been taken into consideration, it was thought best to defer the matter until the committee meeting on Monday next. The committee desired to express to the adventurers their sense of the great loss they had sustained in the lamented death of their late Chairman, Sir F. M. Williams, Bart., who always took the warmest interest in the mine. They hoped to give notice of a new member of the committee in about a month previous to the next meeting.

Capt. JOSIAH THOMAS, the manager, said he thought the shareholders would agree with him that the report was a good one considering the low price at which the various points of operation were valued—only 36*l.* a ton. If they had the price for tin as they had in 1872 (95*l.* a ton), or even the average price of the last 25 years, between 60*l.* and 70*l.* a ton, the value of the several points would be very great. However, they must take it as it was, and hope that it would in the course of time rise to something like the average value. They had reason to congratulate themselves that the good old mine had stood the depression as well as it had. If they had been told five years ago that tin would go down to 35*l.* per ton, none of them would have believed it, nor would they have thought that Dolcoath or any other Cornish mine would have paid costs, much less declare dividends. He did not think they would be beaten by Australia, Tasmania, or any other tin-producing country just yet. (Hear,) He was of opinion that they would get a tolerably reasonable price for tin again in time, and that those who had the courage and patience to wait would be rewarded. (Hear, hear.) He did not know whether most of them had read the recent articles in the *Mining Journal* on tin; they had been written in a very different strain to what they formerly were. For some years past the articles in the *Mining Journal* had been prognosticating evil, and saying that tin must go lower; and although the mining community were not willing to believe it, yet those articles proved too correct. Now, the articles in that paper were very hopeful, and emphatically stated that the price of tin would advance; and as their prognostications with regard to the falling of the tin standards had proved true, he thought they had some reason to believe them now with respect to the rise. Referring to the work done in the mine, he said that in the new shaft, by dividing it into several sections, and employing upwards of 100 men, they had succeeded in putting in a new road from the surface to the 338 in exactly three weeks. During the present three months they proposed to put in a new skip-road in the engine-shaft, and probably after a while they might think it necessary to put skip-roads in two other shafts in the western part of the mine, for they found that the boring machine opened up the ground much faster than was formerly done by hand, and if tin advanced they would want to raise a larger quantity of stuff. They had driven during the last 12 weeks with the Barrow drill in the 314 fm. level 29 fms., which was at least four times as much as could have been done by hand labour, and at a much less cost per fathom. When the boring machine was first introduced into Cornwall very few people believed that they would ever be successful in that county, but the proprietors of the Barrow drill took a six months' contract to drive one of the hardest ends in Dolcoath, and they succeeded in driving it three times as fast as could be done by hand labour, and at 20 per cent. less cost. The Dolcoath committee then purchased the Barrow machines, and since that time they had erected a larger air compressor and pipes, and now the machines were doing better still. (Hear, hear.) When they sunk the shaft to the 352 they thought it advisable to drive both east and west by boring machines also, but they were of opinion that it might be well if they were to try some other drill, provided they could get the proprietors to enter into a contract. If they were to purchase drills it would cost them some hundreds of pounds. They had communicated with the Beaumont Drill Company on the subject of entering into a contract, and they wanted 28*l.* a fathom, and the mine supply the air. The committee thought they could get it at a less cost, and they consequently wrote to the Eclipse boring machine proprietors asking if they were prepared to enter into a contract to bore some ground in the mine, to which they replied no, but were willing to sell their machines. A similar reply was received from Mr. Loam on behalf of the Barrow Drill Company. They next wrote to Messrs. Ullathorne and Co., of London, the proprietors of the Champion drill, who had entered into a contract with them to drive 50 fms. east and 50 west at a cost of 16*l.* 5s. per fm., and the mine supply the necessary air, which would not cost more than 2*l.* per fm. The 12 months' driving in the 338 cost them by hand labour 25*l.* per fm., whereas now it was only to cost them 16*l.* 5s., with about an extra 2*l.* per fm. for supplying the air. He hoped that contract would prove advantageous both to the shareholders and Messrs. Ullathorne, and expressed the belief that the time was coming when no one would think of working Cornish mines without the use of boring machines. They had put one of Tangye's special pumps in the winze under the 338, and he found that it answered very well indeed. He believed they could draw water with it at one-fifth less cost of hand labour, and considered that those pumps would be a great advantage to mines using compressed air. Altogether he thought they met under very favourable circumstances that day; he believed the worst in regard to the tin market was past, and as far as he could judge they might look hopefully to the future. (Applause.)

The CHAIRMAN moved the adoption of the accounts and report, which was seconded by Mr. HARRIS, and carried unanimously.

At the dinner which followed the usual loyal toasts were given. The CHAIRMAN, proposing "Success to Dolcoath and the Health of the Agents," said the mine had arrived at a wonderful depth. The shaft was 352 fms. below the adit, or 380 fms. from surface, and he supposed that if they sunk about another 120 fms. they would be about ½ mile underground. Referring to the Australian tin, he said the adventurers had been spending a great deal of money. The miners had been earning from 7s. to 9s. a day, while the adventurers had lost their money. The Australian shareholders had gone on losing money, and he did not know that Tasmania was much better. Mount Bischoff did not supply more tin than Dolcoath.——Capt. JOSIAH THOMAS, replying for the agents, said the average price of tin during the past quarter was nearly 1*l.* a ton less than the preceding one, which made a difference of about 300*l.* on their balance that day.

Capt. C. THOMAS, Cook's Kitchen, replied for neighbouring mines.

— *Western Daily Mercury.*

CHONTALES MINING COMPANY.

The following directors' report will be presented to the meeting of shareholders which has been called for Thursday:—

During the six months 3602 tons of ore were crushed, producing 918 ozs. of gold, or an average of 5·1 dwts. per ton. The cost of breaking, raising, and dressing this ore, including management at the mines and in England, was 4050*l.* 18s. 6d., equal to 1*l.* 2s. 5d. per ton of stuff, whilst the total receipts were 2467*l.* 19s. 5d. It will be seen that the result of the operations has not been very successful owing to various causes, but more particularly to the non-arrival of machinery shipped so far back as November last; this mainly arose by the non-delivery at Greytown by the Steam Packet Company from stress of weather, and which was fully explained at the last meeting of shareholders, held on May 30.

Since the last meeting of shareholders, in consequence of this delay, resulting in the falling off in the returns, the directors felt compelled to exercise their power of issuing debentures to the amount of 5000*l.* on the terms contained in the circular issued in July last; 1175*l.* only of these debentures have at present been taken up, which has, however, been enough to enable your director to keep the mines going without stint, and to pay off the loan to the bankers.

The delay, although in one sense injurious, gave Mr. White greater opportunity for thoroughly overhauling his plant. The result is that now that the machinery is in working order, continuous and increasing profits have been made for the last three months, with every expectation of being maintained—indeed, there is every reason to believe that if more powerful means were at Mr. White's disposal, either by increased supplies of water for the water-wheel or by a second steam engine (the one sent out 13 years ago being worn out) to drive the pneumatic stamps, still more satisfactory returns would be secured.

Bearing this in mind, the directors for some time past have had under consideration some improved stamps to do a greater amount of work; they have also decided upon ordering a second portable steam-engine, in the reliance that the shareholders will testify their approval by taking up the remainder of the unallotted debentures to pay for this increased outlay.

The development of the Pavon Mine, which has at more than one general meeting been the subject of consideration, has continued to engage the attention of the board. Having taken counsel with the manager, they have satisfied themselves that any application of the company's funds to such object would at the present time be premature, and that the best policy is to concentrate all energy in forwarding the development of the upper mines, all of which, in Mr. White's judgement, present very encouraging features. As soon as the resources of this latter portion of the company's property are in course of being successfully realised the time will probably have arrived for seriously considering the opening out of the Pavon property. The directors beg to annex the last letter they have received from their manager Mr. White, as well as his report and views for the future, which they consider highly encouraging.

HINGSTON DOWN.—At the meeting, yesterday, the directors' report was adopted, and the shareholders expressed their approval of the suggestion of the board to carry on the mine as at present, and to extend the adit level to intersect the lodes in the Clitters sett. Capt. T. Richards says—"The next sampling of ore, on the 29th inst., will probably be from 200 to 220 tons of fair quality ore, and the present prospects on the whole I consider are exceedingly good."

[For remainder of Meetings see to-day's Journal.]

SAND MOULDS FOR METAL CASTINGS.—An improved apparatus to be used in making moulds in sand for casting in metal, and especially in making moulds for matched work by compression, has been invented by Messrs. AIKIN and DRUMMOND, of Louisville, Kentucky. They connect a follower plate, made in sections, with mechanism, which actuates the portion of the follower carrying the patterns simultaneously with the intermediate sections of the said follower plate, in rising to force the pattern into the sand; but in the reverse movement first withdraws the pattern, leaving the intermediate section of the follower plate in contact with and supporting the sand until the patterns have been withdrawn; the followers are withdrawn also, leaving the sand in the flask with the pattern duly moulded therein.

BEARINGS FOR ROLLS.—The bearings which are generally used for the rolls of rolling mills employed for metallurgical purposes are made of brass—either copper and tin or copper and zinc—which is very expensive, and very liable to quickly wear and cause the rolls to get out of truth. Mr. J. D. GREY, of Aberavon, has, therefore, patented an invention the objects of which are to manufacture the same of less expensive materials, and in a more simple meshod than hitherto, and to render the bearings more durable and not so liable to get out of line or parallelism with each other as they are now. According to the improved manufacture he first makes a casting of iron, having a hollow of a greater radius than that of the roll shaft, but intended to be concentric therewith, and provided on each side with a ledge or inner projection. He then places this casting at a suitable distance from, but concentric with, the neck of the roll, or another shaft, of the same size or diameter, and fills the hollow or space between the cast-iron piece and the shaft or roll with molten spelter, which is retained in position by the said ledges or inner projections, and runs to the exact size and shape of the neck of the roll, and dispenses with the trouble and expense of the usual practice of running the rolls for the purpose of wearing the brasses to the shape of the necks thereof; or, in lieu of pouring molten spelter into the hollow of the iron casting, he can pour a composition of spelter and tin, or of spelter and antimony; or he can dispense with the cast-iron piece altogether, and use only a casting of spelter or antimony, but he prefers the combined use of the iron casting and the inner casting or lining of spelter, as previously described.

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Mr. R. MIDDLETON, of this Journal, will on personal application give some more particulars, and is also authorised to select among applicants.

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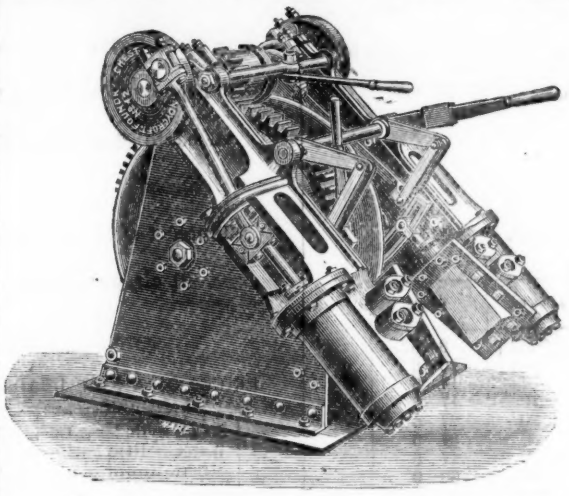

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Tared, Oiled, and Non-Inflammable.

THE OILED CLOTH IS ESPECIALLY RECOMMENDED FOR DAMP MINES, AND IS ALSO A GOOD COVERING FOR SHEDS.
THE NON-INFLAMMABLE FOR THE MORE DANGEROUS MINES.

Samples and prices free, on application at the Works,

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BRYDON AND DAVIDSON'S ROCK DRILL,

SELECTED BY THE BRITISH AND OTHER GOVERNMENTS.

Reduced prices of this Rock Drill, Nos. 1 and 2, £32 and £34.
SUBJECT TO DISCOUNT.

IMPROVED AIR COMPRESSORS.

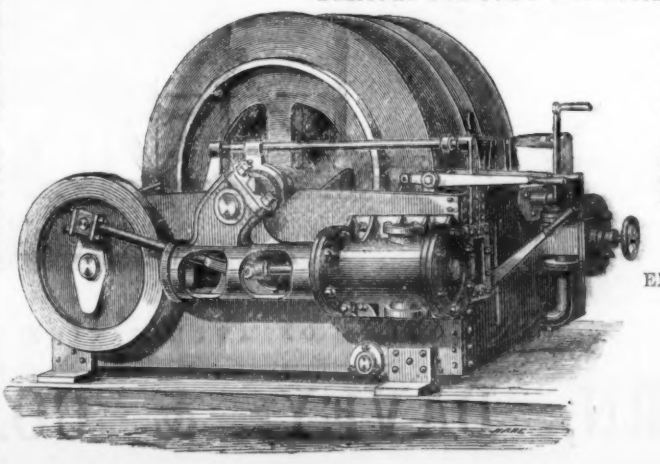
Makers of Pumping and Winding Engines, Steam Hammers, Boilers, Pump Pipes, &c., &c. Castings of all kinds.

BRYDON AND DAVIDSON, ENGINEERS,
WHITEHAVEN.

WANTED, AN INFLUENTIAL AGENT IN LONDON, TO SELL THE ABOVE SPECIALITIES, AND GENERAL MACHINERY.

STEVENS' PATENT UNDERGROUND WINDING ENGINE,

DESIGNED FOR USING COMPRESSED AIR OR STEAM,



SIMPLE, COMPACT, PORTABLE.
Silver Medal, Royal Cornwall Polytechnic Society, 1876.

No. 1 size, 7 in. single cylinder, with 2 ft. drums.
No. 2 size, 9 in. single cylinder, with 2 ft. 6 in. drums.
Larger sizes made with two cylinders.
A,— 6 in. double cylinder, with 2 ft. 3 in. drums.
B,— 8 in. „ „ 3 ft. 0 in. drums.
C,—10 in. „ „ 3 ft. 6 in. drums.
D,—12 in. „ „ 4 ft. 6 in. drums.

MANUFACTURED BY
THE USKSIDE CO.,
ENGINEERS, MAKERS OF PUMPING AND WINDING MACHINERY, AND FORGINGS OF EVERY DESCRIPTION,
NEWPORT, MON

Agents for the six Northern Counties—
TANGYE BROTHERS, ST. NICHOLAS BUILDIN NEWCASTLE-ON-TYNE.

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MAY AND MOUNTAIN,

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ENGINEERS, MILLWRIGHTS, IRONFOUNDERS, COPPERSMITHS AND BOILER MAKERS,

SOLE MANUFACTURERS OF

TORKINGTON & HEYS'

PATENT LUBRICATOR,

FOR

OIL, TALLOW, OR OTHER LUBRICANT.

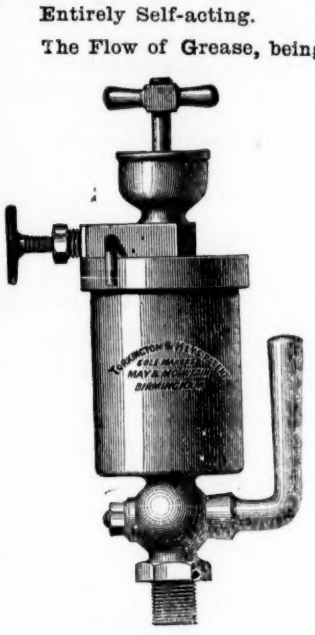
Entirely Self-acting.

The Flow of Grease, being regulated by the Steam, is constant, varying with the amount of Steam used.

No Waste.

Perfect Lubrication.

Greatest possible Economy.



No.	Size. Inches.	Horse-power.	Price.
00	1¼	Agricultural Engines... 5 to 7	8s. 6d.
0	1½		10 6
1	2		14 6
2	2½	7 10	17 6
3	3	10 20	27 6
4	3½	20 30	37 6
5	4½	30 50	47 6
6	5	50 70	60 0
7	6	70 100	90 0
8	7	100 200	105 0

COLEBROOK'S Patent STEAM PUMP.

THE MOST RELIABLE AND ECONOMICAL DIRECT-ACTING PUMPS.

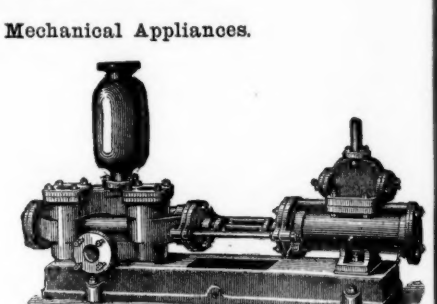
Short Pistons and Long Strokes.

The Slide Valve is worked by the Exhaust Steam alone.

No Tappets, Valves, Levers, or other Mechanical Appliances.

All parts Simple and Easy of access.

Adapted for all purposes and to all circumstances.

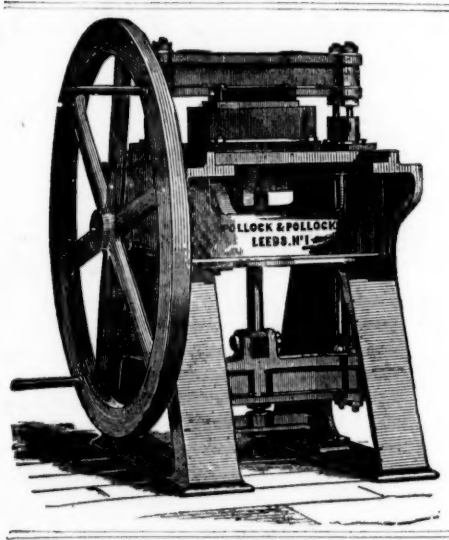


PRICES OF A FEW LEADING SIZES.

Steam cylinder ...In.	3	4	4	6	6	7	8	8	10
Water ditto ...In.	1½	2	4	4	6	6	6	8	8
Stroke	12	18	18	18	18	18	18	18	8
Gallons per hour.....	720	1260	5040	4280	9660	8700	7920	12,180	12,060
Price .....£	16	19	25	33	41	45	50	65	80

LARGER AND SMALLER SIZES IN ALL COMBINATIONS OF STEAM AND WATER CYLINDERS.

DESCRIPTIVE PRICES ON APPLCATION.



POLLOCK AND POLLOCK,

LONGCLOSE WORKS, NEW TOWN, LEEDS,

POLLOCK'S PATENT BRICK PRESS,

The New "XL" Brick-Making Machines,

THE CHEAPEST AND BEST IN THE MARKET.

Improved Grinding Pans, with patent self-acting delivery.
Vertical and Horizontal Engines.

COLLIERY ENGINEERS.—WINDING ENGINES OF ALL SIZES.

POLLOCK AND MITCHELL'S PATENT KILNS are the Cheapest and Simplest.

London Office—155, Fenchurch Street, E.C.

GOLD MEDAL FOR PUMPING MACHINERY—PARIS EXHIBITION, 1878.

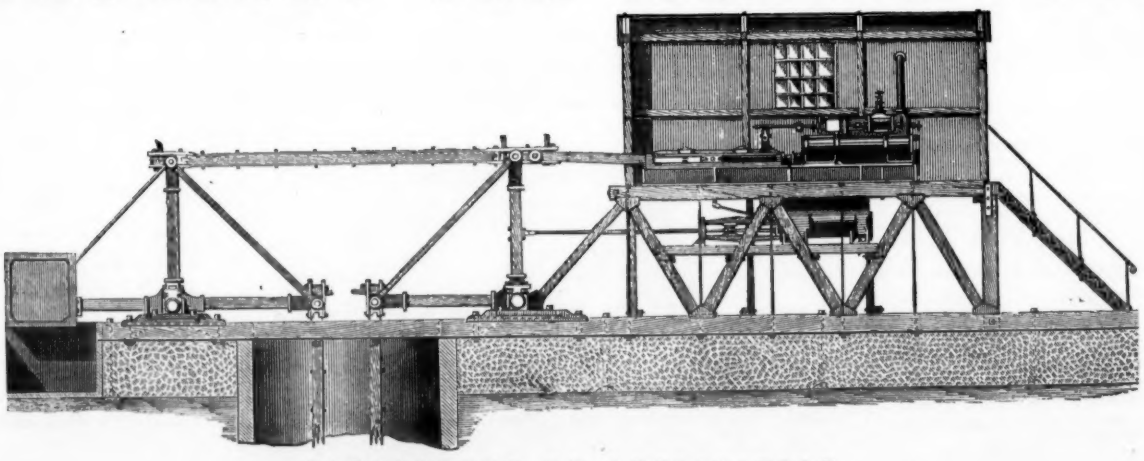
PORTABLE PUMPING ENGINES

FOR TEMPORARY AND SINKING PURPOSES.

Compound Differential Pumping Engines.

—

Air Compressing Engines.



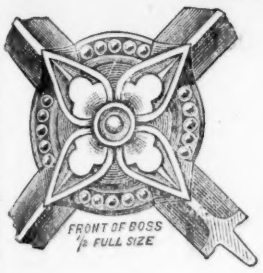
Hydraulic Engines and Mining Plant of all kinds.

CATALOGUES ON APPLICATION

HATHORN, DAVEY, & CO., LEEDS.

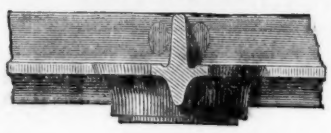
HARRIS'S PATENT WROUGHT-IRON WINDOWS.

DOME AND OTHER ROOF LIGHTS, FLOOR AND PAVEMENT LIGHTS, ETC.



GREAT BRITAIN,
UNITED STATES OF AMERICA,

PATENTED IN

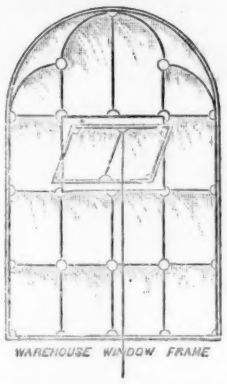


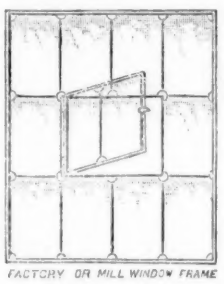
FRANCE,
GERMANY, AND BELGIUM.

ARE STRONGER, SUPERIOR, AND CHEAPER THAN ANY OTHER METAL SASHES YET PRODUCED—COST LESS FOR GLAZING—ARE AS CHEAP IN MANY CASES AS WOOD

—CAN BE DESIGNED AND MANUFACTURED TO SUIT ANY STYLE OF ARCHITECTURE OR POSITION WHERE A WINDOW MAY BE REQUIRED.
ARE BEING EXTENSIVELY USED IN—

Private Houses,
Parsonage Houses,
Farm Houses,
Churches,
Chapels,
Schools,





ILLUSTRATED CATALOGUES ON APPLICATION.

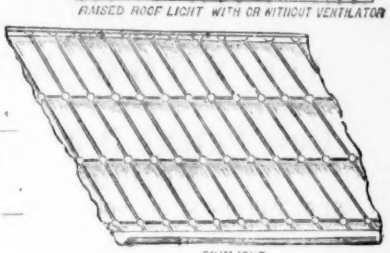
In Basement Storeys and Exposed Positions Shutters and Guard Bars are dispensed with.

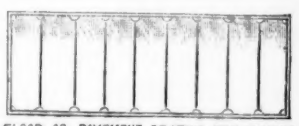
HOME AND

ILLUSTRATED CATALOGUES ON APPLICATION.

Security is obtained in these Skylights without Guard Bars, and with less obstruction to Light.

EXPORT.





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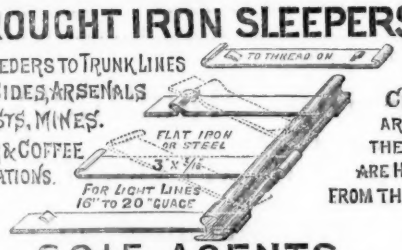
SAFE, STRONG ROOM, AND PARTY WALL DOORS, AND EVERY KIND OF CONSTRUCTIONAL AND BUILDERS' IRONWORK, LIFTS, HOISTS, ELECTRIC BELLS AND TELEGRAPHS, &c.

90, CANNON STREET, LONDON, E.C.; AND BEAUFORT IRONWORKS, BRISTOL.

A NARROW GUAGE RAILWAY **LEGRAND'S PATENT** COMPLETE IN TWO PARTS, FROM £250 PER MILE

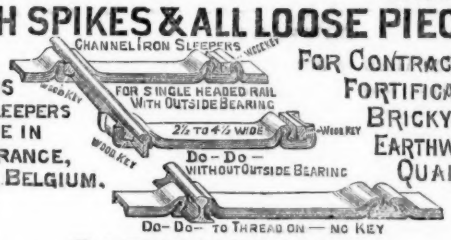
WROUGHT IRON SLEEPERS TO FIT ANY RAIL, DISPENSING WITH SPIKES & ALL LOOSE PIECES.

FOR FEEDERS TO TRUNK LINES
QUAYSIDES, ARSENALS
FORESTS, MINES.
SUGAR & COFFEE PLANTATIONS.



THE OUTSIDE CLIPPING SLEEPERS ARE LAID FIRST, THEN THE INSIDE SLEEPERS ARE HAMMERED UP AS FROM THE DOTTED LINES.

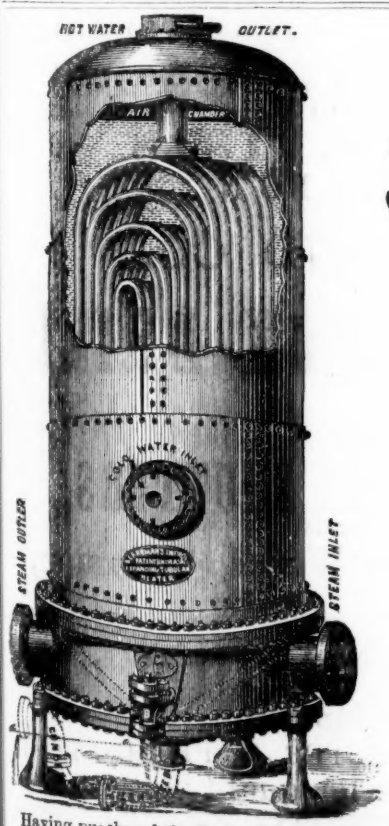
7 MILLIONS OF THESE SLEEPERS ARE IN USE IN ENGLAND, FRANCE, GERMANY, BELGIUM.


CHANNEL IRON SLEEPERS
FOR SINGLE HEADED RAIL WITH OUTSIDE BEARING
2½ TO 4½ WIDE
WOOD KEY
DO-DO— WITHOUT OUTSIDE BEARING
DO-DO— TO THREAD ON — NO KEY

FOR CONTRACTORS.
FORTIFICATIONS
BRICKYARDS,
EARTHWORKS,
QUARRIES

SOLE AGENTS, **SHAW BROTHERS,** BIRMINGHAM

DRAWINGS & PARTICULARS ON APPLICATION. TO SAVE TIME PLEASE GIVE GUAGE, WEIGHT OF RAIL AND KIND OF TRAFFIC.



IMPORTANT.

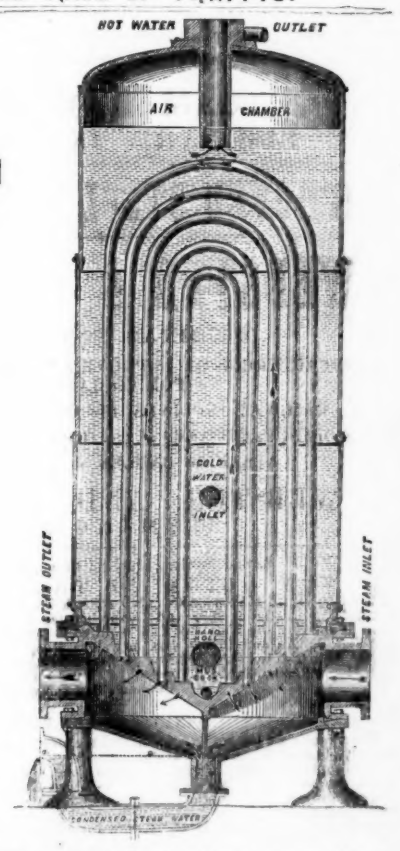
JOSEPH WRIGHT AND CO.

(LIMITED),

NEPTUNE FORGE ENGINE AND BOILER WORKS,

TIPTON, STAFFORDSHIRE,

AND AT 147, QUEEN VICTORIA STREET, LONDON, E.C.



Having purchased the Engineering Business lately carried on by R. BERRYMAN AND CO., at 23, Congreve-street, Birmingham, and 28, Wilson-street, Finsbury-square, London, have removed the whole to their Works at TIPTON, to which place ALL COMMUNICATIONS SHOULD IN FUTURE BE ADDRESSED, and where the BERRYMAN HEATER can be seen at work, and in every stage of manufacture.

Being the SOLE MAKERS and PATENTEES of these CELEBRATED COAL SAVERS and EXHAUST STEAM UTILISERS, and having remodelled and greatly improved them, adding largely to their HEATING SURFACE and WATER CAPACITY, J. W. and Co. have put down a special plant, which includes an entire new set of improved patterns, enabling them to offer these FEED WATER HEATERS to the public at

GREATLY REDUCED PRICES.

This arrangement of BRASS TUBES of a great length giving an enormous HEATING SURFACE makes this HEATER not only the MOST POWERFUL ever invented, but its FIRST COST PER FOOT OF HEATING SURFACE IS LESS THAN HALF THAT OF ANY OTHER. It will condense the whole of the Exhaust Steam from the Engine if required, and entirely does away with the NOISE and BACK PRESSURE from exhaust pipes.

ALL THE TUBES ARE OF SPECIALLY PREPARED SOLID DRAWN BRASS AND COPPER; both ends are expanded into the bored holes of the same Tube Plate, METAL to METAL, and every tube is free to expand and contract independent of each other. Leakage is impossible, as, when the tubes are once fixed, nothing short of cutting out will remove them. No scurf adheres to the tubes because of the difference of expansion between SCURF and BRASS. The inside of the Heater can be washed out by means of the mud cock and hand hole whilst at work.

Only one pump or injector is required, and as the Heater is placed between the pump and the boiler, the water is forced, COLD, into it, and passes out at the top HOT into the boiler direct. Where the WATER WORKS PRESSURE is sufficient no pump or injector is needed.

The water being heated to BOILING POINT UNDER PRESSURE in the Heater, a saving of from 20 per cent. to 25 per cent. in fuel is effected; the disastrous results of grease in boilers are also avoided, the sewage and other loose matter in the water being deposited in the Heater, the acids are liberated there instead of in the boiler.

Every part can be lined with BRASS, COPPER, or LEAD, as may be required in special cases for heating water or any kind of liquor in large quantities for CHEMICAL WORKS, BATHS, WASH-HOUSES, AQUARIA, GREENHOUSES, BREWERIES, WOOL WASHING, DYE WORKS, TANNERIES, &c., &c.; they will also HEAT AIR FOR CUPOLAS AND BLAST FURNACES, and are now at work as INTERHEATERS for compound engines with direct steam from the boiler with a further saving of 15 per cent.

The New Price List, with detail information, is now ready, and will be sent on application, together with an Illustrated Catalogue, with references and testimonials from Firms using FOUR HUNDRED AND THIRTY-THREE of these Heaters.

At the PARIS EXHIBITION the Jurors have Awarded

THE GOLD MEDAL, THE SILVER MEDAL, AND HONOURABLE MENTION

FOR MY LATEST PATENTED STONE BREAKERS AND ORE CRUSHERS.

Stones broken equal, and Ores better, than by hand, at one-tenth the cost.

H. R. MARSDEN,

ORIGINAL PATENTEE AND SOLE MAKER OF BLAKE'S

Improved Patent Stone Breakers & Ore Crushers.

New Patent Reversible Jaws, in Sections, with Patent Faced Backs.

NEW PATENT ADJUSTABLE TOGGLES.

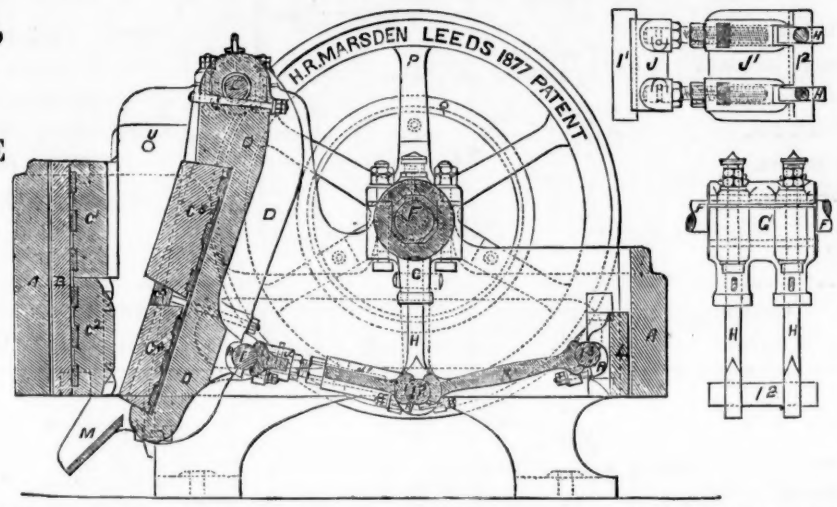
OVER **2500** IN USE.

New Patent Draw-back Motion.

NEW PATENT STEEL TOGGLE BEARINGS.

70

PRIZE MEDALS.



READ THIS—

Wharthole Lime Works, Maryport, Whitehaven, November 7, 1873.

H. E. MARSDEN, Esq., Soho Foundry, Meadow-lane, Leeds.

DEAR SIR,—The machine I have in use is one of the large size, 24 in. by 12 in. The quantity we are breaking daily with this one machine is 250 tons, the jaw being set to break to a size of 2¼ in. We have, however, frequently broken over 300 tons per day of ten hours, and on several occasions over 360 tons during the same period. The stone we break is the blue mountain limestone, and is used as a flux in the various ironworks in this district. We have now had this machine in daily use for over two years without repairs of any kind, and have never had occasion to complain of any inconvenience in using the machine. I hope the one you are now making for me may do its work equally well. The cost—INCLUDING ENGINE-POWER, COALS, ENGINEMAN, FEEDING, and all EXPENSES OF EVERY KIND—is just 3d. per ton. Should any of your friends feel desirous of seeing one of your machines at work I shall have much pleasure in showing the one alluded to.

I am, dear Sir, yours very truly,
WILLIAM MILLER.

AND THIS—

Wharthole Lime Works, Aspatria, Cumberland, July 11th, 1878.

H. R. MARSDEN, Esq., Soho Foundry, Leeds.

DEAR SIR,—We are in receipt of your letter of 4th inst. may just state that the stone breaker above named has been under my personal superintendence since its erection, and have no hesitation in saying that it is as good now as it was five years ago.

I am, dear Sir, yours faithfully,
FRANCIS GOULD.

GREATLY REDUCED PRICES ON APPLICATION.

ALL BEARINGS are renewable, and made of **H.R.M.'s Patent Compound ANTIFRICTION METAL.**

CATALOGUES, TESTIMONIALS, &c.

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.

The Barrow Rock Drill

COMPANY

Are NOW PREPARED to SUPPLY their DRILLS, the ONLY ONES that have been SUCCESSFULLY WORKED in the MINES of CORNWALL. At DOLCOATH MINE, in the HARDEST known ROCK, a SINGLE MACHINE has, since its introduction in July, 1876, driven MORE THAN THREE TIMES the SPEED of HAND LABOUR, and at TWENTY PER CENT. LESS COST PER FATHOM.

In ordinary ends two machines may be worked together, and at a proportionately increased speed. They are strong, light, and simple, easily worked, and adapted for ends and stopes, and the sinking of winzes and shafts.

The company are also prepared to SUPPLY COMPRESSORS, and all necessary appliances for working the said Drills.

Apply to—

LOAM AND SON,
LISKEARD, CORNWALL.

IMPROVED STEEL WIRE FOR ROPES.

WEBSTER & HORSFALL,

(ORIGINAL PATENTEES),

MANUFACTURERS OF IMPROVED STEEL WIRE FOR ROPES FOR COLLIERIES,

RAILWAY INCLINES, PLOUGHS, HAWSERS, &c.

SOLE MANUFACTURERS of the HOMOGENEOUS WIRE for the ATLANTIC CABLES of 1865 and 1866.

WEBSTER AND HORSFALL,
BIRMINGHAM.

Second Edition. Just published, price 8s. 6d.

A NEW GUIDE TO THE IRON TRADE OR, MILL MANAGERS' AND STOCK-TAKERS' ASSISTANT;

Comprising a Series of New and Comprehensive Tables, practically arranged to how at one view the Weight of Iron required to produce Boiler-plates, Sheet-iron, and Flat, Square, and Round Bars, as well as Hoop or Strip Iron of any dimensions. To which is added a variety of Tables for the convenience of Merchants, ncluding a Russian Table. BY JAMES ROSE.

Batman's Hill Ironworks, Bradley, near Bilston.

OPINIONS OF THE PRESS.

"The Tables are plainly laid down, and the information desired can be instantaneously obtained."—*Mining Journal.*

"900 copies have been ordered in Wigan alone, and this is but a tithe of those to whom the book should commend itself."—*Wigan Examiner.*

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THE SOUTH WALES EVENING TELEGRAM (DAILY), and SOUTH WALES GAZETTE (WEEKLY), established 1857,

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The "Evening Telegram" is published daily, the first edition at Three P.M., the second edition at Five P.M. On Friday, the "Telegram" is combined with the South Wales Weekly Gazette," and advertisements ordered for not less than six consecutive insertions will be inserted at an uniform charge in both papers.

P. O. O. and cheques payable to HENRY Russell EVANS, 14, Commercial-street Newport, Monmouthshire.

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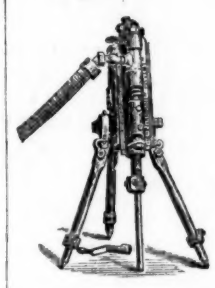
The IRON AND COAL TRADES' REVIEW is extensively circulated amongst the Iron Producers, Manufacturers, and Consumers, Coalowners, &c., in all the iron and coal districts. It is, therefore, one of the leading organs for advertising every description of Iron Manufactures, Machinery, New Inventions, and all matters relating to the Iron, Coal, Hardware, Engineering, and Metal Trades in general.

Offices of the Review: 7, Westminster Chambers, S.W.

Remittances payable to W. T. Pringle.

THE "CHAMPION" ROCK BORER



MINE AND QUARRY STANDS, STEEL DRILLS, SPECIALLY PREPARED INDIARUBBER HOSE, TESTED IRON PIPES, &c.

Air-Compressing Machinery,

Simple, strong, and giving most excellent results, and

ELECTRIC BLASTING APPARATUS.

Full particulars of rapid and economical work effected by this machinery, on application.

CONTRACTS TAKEN, OR SPECIAL TERMS FOR HIRE

ULLATHORNE AND CO., Mechanical and Consulting Engineers, 63, QUEEN VICTORIA STREET, LONDON, E

PARIS EXHIBITION, 1878.

HONOURABLE MENTION

Has been awarded to

SALMON, BARNES, AND CO.,

FOR THEIR

PATENT ROANHEAD ROCK DRILL,

AND THE HIGHEST AWARD,

A SILVER MEDAL,

FOR

IRON AND WOOD REVOLVING SHUTTERS,

Worked by their PATENT BALANCE-WEIGHT MOTION.

Canal Head Foundry and Engineering Works, Ulverston,

LANCASHIRE.

THOMAS TURTON AND SONS,

MANUFACTURERS OF

MINING STEEL of every description.

CAST STEEL FOR TOOLS. CHISEL, SHEAR, BLISTER, & SPRING STEEL

MINING TOOLS & FILES of superior quality.

EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.

SHEAF WORKS AND SPRING WORKS, SHEFFIELD.

LONDON OFFICES.—90 CANNON STREET, E.C. PARIS DEPOT—12, RUE DES ARCHIVES.
NEW YORK STORE—102, JOHN STREET.

J. WOOD ASTON AND CO., STOURBRIDGE

(WORKS AND OFFICES ADJOINING CRADLEY STATION),

Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS, RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions.

STOURBRIDGE FIRE BRICKS AND CLAY.

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